N8100-941F/942F/943F

NEC Express5800/120Lh
User's Guide

1st Edition
08-2004
856-124032-101-00

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First Printing, August 2004
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Keep this manual at hand for quick reference at anytime necessary.

SAFETY INDICATIONS

Follow the instructions in this manual for your safety to use the NEC Express server.

Your server contains components with possible danger, hazards that may cause by ignoring warnings, and preventive actions against such hazards.

Server components with possible danger are indicated with a warning label placed on or around them as well as described in this manual.

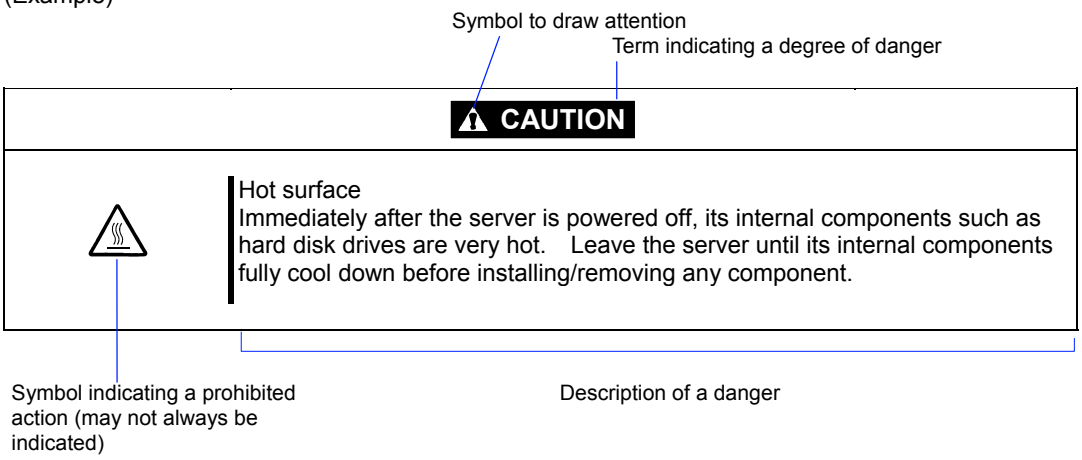
In this manual or warning labels, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ WARNING	Indicates the presence of a hazard that may result in death or serious personal injury if the instruction is ignored.
⚠ CAUTION	Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage if the instruction is ignored.

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type. (Attention)
	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action. (Prohibited Action)
	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard. (Mandatory Action)

(Example)


Symbol to draw attention
Term indicating a degree of danger
⚠ CAUTION
Hot surface
Immediately after the server is powered off, its internal components such as hard disk drives are very hot. Leave the server until its internal components fully cool down before installing/removing any component.
Symbol indicating a prohibited action (may not always be indicated)
Description of a danger

SYMBOLS USED IN THIS MANUAL AND WARNING LABELS

Attentions

	Indicates that improper use may cause an electric shock.
	Indicates that improper use may cause personal injury.
	Indicates that improper use may cause fingers to be caught.
	Indicates that improper use may cause fumes or fire.
	Indicates a general notice or warning that cannot be specifically identified.
	Indicates that improper use may cause loss of eyesight due to laser beam.

Prohibited Actions

	Indicates a general prohibited action that cannot be specifically identified.
	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.

Mandatory Action

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.
	Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Statement

Warning: This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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Momentary voltage drop prevention:

This product may be affected by a momentary voltage drop caused by lightning. To prevent a momentary voltage drop, an AC uninterruptible power supply (UPS) unit should be used.

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PREFACE

Congratulations on the purchase of your NEC Express server.

Purchase of this server is your assurance of receiving state-of-the-art, high quality hardware to meet your needs, both now and in the future.

Read this User's Guide thoroughly to fully understand handling of the NEC Express server and appreciate its functions to the maximum extent.

ABOUT THIS USER'S GUIDE

This manual is a guide for proper setup and use of your server.
This manual also covers useful procedures for dealing with difficulties and problems that may arise during setup or operation of your server.
Keep this manual for future use.
The following describes how to proceed with this manual.

How to Use This Manual

To aid you in finding information quickly, this manual contains the following information:

Chapter 1 Notes on Using Your Server
includes information that needs attention to use the server. Make sure to read this chapter before setting up and using the server. It also includes requirements and advisory information for transfer and disposal of the server.

Chapter 2 General Description
includes information necessary to use the server, such as names and functions of its components.

Chapter 3 Setting Up Your Server
tells you how to select a site, unpack the system, make cable connections, and power on your system.

Chapter 4 Configuring Your Server
tells you how to configure the system and provides instructions for running the BIOS Setup Utility and the Adaptec Configuration Utility, which is used to configure SCSI devices in your system. This chapter also provides information on mother board jumper settings.

Chapter 5 Installing the Operating System with Express Setup
describes how to install the operating system.

Chapter 6 Installing and Using Utilities
describes how to install the utilities for the server. It also includes a description on using the attached "NEC EXPRESSBUILDER" CD-ROM.

Chapter 7 Maintenance
provides you with all the information necessary to maintain successful operation of the server. This chapter also includes a description on relocating and storing the server.

Chapter 8 Troubleshooting
contains helpful information for solving problems that might occur with your system.

Chapter 9 Upgrading Your Server
provides you with instructions for upgrading your system with an additional processor, optional memory, optional add-in cards, hard disk drives, peripheral devices, and power supply.

Chapter 10 Internal Cabling Diagram
includes cabling information for the one onboard SCSI controller, the IDE controller, the optional RAID controller, and the power supply.

Appendix A Specification
provides specifications for your server.

Appendix B Other Precautions
provides supplementary notes on using the server.

Appendix C IRQ and I/O Port Address
provides a list of factory-set IRQs and I/O port addresses assigned.

Appendix D Installing Windows Server 2003
describes how to install Microsoft Windows Server 2003 without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003. See Chapter 5 for details.

Appendix E Installing Windows 2000
describes how to install Microsoft Windows 2000 without using Express Setup. Using the Express Setup tool is recommended for installing Windows 2000. See Chapter 5 for details.

Appendix F Product Configuration Record Table
provides a table to be filled with your server configuration.

Text Conventions

The following conventions are used throughout this manual. For safety symbols, see "SAFETY INDICATIONS" provided earlier.

IMPORTANT:	Items that are mandatory or require attention when using the server
NOTE:	Helpful and convenient piece of information

IN THE PACKAGE

The carton contains various accessories, as well as the server itself. See the packing list to make sure that you have everything and that individual components are not damaged. If you find any component missing or damaged, contact your sales agent.

- Store the provided accessories in a designated place for your convenience. You will need them to install an optional device or troubleshoot your server, as well as to set it up.
- Make a backup copy of each provided floppy disk, if any. Store the original disk as the master disk in a designated place, and use its copy.
- Improper use of any provided floppy disk or CD-ROM may alter your system environment. If you find anything unclear, immediately ask your sales agent for help.

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Chapter 1

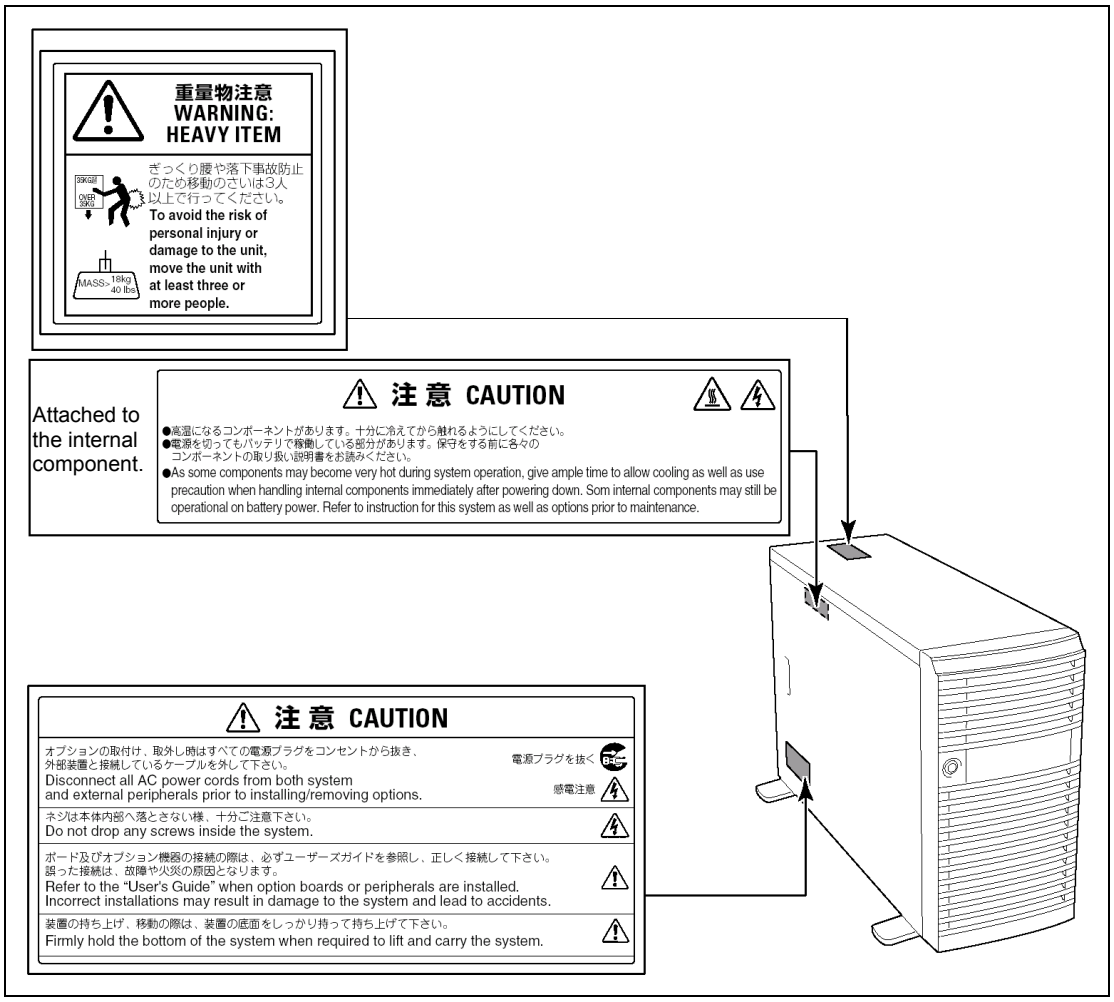
Notes on Using Your Server

This chapter includes information necessary for proper and safe operation of your server.

WARNING LABELS

The warning label is attached to components with possible danger or their vicinity in your server to inform the user that a hazardous situation may arise when operating the server. (Do not take off any label or soil it.)

If you find any label unattached, almost peeled off, or soiled, making the warning illegible, contact your sales agent.


重量物注意
WARNING:
HEAVY ITEM
ぎっくり腰や落下事故防止のため移動のさいは3人以上で行ってください。
To avoid the risk of personal injury or damage to the unit, move the unit with at least three or more people.
MASS: 18kg 40 lbs
Attached to the internal component.
注 意 CAUTION
●高温になるコンポーネントがあります。十分に冷えてから触れるようにしてください。
●電源を切ってもバッテリで稼働している部分があります。保守をする前に各々のコンポーネントの取り扱い説明書をお読みください。
●As some components may become very hot during system operation, give ample time to allow cooling as well as use precaution when handling internal components immediately after powering down. Som internal components may still be operational on battery power. Refer to instruction for this system as well as options prior to maintenance.
注 意 CAUTION
オプションの取付け、取外し時はすべての電源プラグをコンセントから抜き、外部装置と接続しているケーブルを外して下さい。
Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.
電源プラグを抜く
感電注意
ネジは本体内部へ落とさない様、十分ご注意下さい。
Do not drop any screws inside the system.
ボード及びオプション機器の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。誤った接続は、故障や火災の原因となります。
Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.
装置の持ち上げ、移動の際は、装置の底面をしっかり持って持ち上げて下さい。
Firmly hold the bottom of the system when required to lift and carry the system.

SAFETY NOTES

This section provides notes on using your server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, see "SAFETY INDICATIONS" provided earlier.

General

⚠ WARNING

Do not use the server for services where critical high availability may directly affect human lives.

Your server is not intended to be used with or control facilities or devices concerning human lives, including medical devices, nuclear facilities and devices, aeronautics and space devices, transportation facilities and devices; and facilities and devices requiring high reliability. NEC assumes no liability for any accident resulting in personal injury, death, or property damage if the server has been used in the above conditions.

Do not use the server if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the power and disconnect the power plug from the outlet, then contact your sales agent. Using the server in such conditions may cause a fire.

Keep needles or metal objects away from the server.

Do not insert needles or metal objects into ventilation holes in the server or openings in the floppy disk or CD-ROM drive. Doing so may cause an electric shock.

⚠ CAUTION

Keep water or foreign matter away from the server.

Do not let any form of liquid (water etc.) or foreign matter (e.g., pins or paper clips) enter the server. Failure to follow this warning may cause an electric shock, a fire, or a failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server. Contact your sales agent.

Power Supply and Power Cord Use

⚠ WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

⚠ CAUTION

Plug in to a proper power source.

Use a proper wall outlet. Use of an improper power source may cause a fire or a power leak.

Do not install the server where you need an extension cord. Use of a cord that does not meet the power specifications of your server may heat up the cord and cause a fire.

Do not connect the power cord to an outlet that has an illegal number of connections.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

Use the authorized power cord only.

Use only the power cord that comes with your server. Use of an unauthorized power cord may cause a fire when the electric current exceeds the rated flow. Also, observe the following to prevent an electric shock or fire caused by a damaged cord.

- Do not stretch the cord harness.
- Do not pinch the power cord.
- Do not bend the power cord.
- Keep chemicals away from the power cord.
- Do not twist the power cord.
- Do not place any object on the power cord.
- Do not bundle power cords.
- Do not alter, modify, or repair the power cord.
- Do not secure the power cord with staples or equivalents.
- Do not use any damaged power cord. (Replace a damaged power cord with a new one of the same specifications. Ask your sales agent for replacement.)

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Installation, Relocation, Storage, and Connection

⚠ CAUTION

Never attempt to lift the server only by yourself.

Your server weighs max. 35 kg (depending on its hardware configuration). Carrying the server only by yourself may strain your back. Hold the server firmly by its bottom with at least three or more people. Do not hold the front door to lift the server. The front door may be disengaged from the server, causing personal injury.

Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this manual. Failure to follow this instruction may cause a fire.

- a dusty place
- a humid place such as near a boiler
- a place exposed to direct sunlight
- an unstable place

Do not connect any interface cable with the power cord of the server plugged to a power source.

Make sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

Do not use any unauthorized interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire. Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.

Cleaning and Working with Internal Devices

⚠ WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion other than described in this manual. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server.

Do not look into the CD-ROM drive.

A laser beam used in the CD-ROM drive is harmful to the eyes. Do not look into or insert a mirror into the drive while the drive is powered. If a laser beam is caught in your eyes, you may lose your eyesight (the laser beam is invisible).

Do not remove the lithium battery.

Your server contains the lithium battery. Do not remove the battery. Placing the lithium close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead lithium battery, contact your sales agent. Do not disassemble the server to replace or recharge the battery by yourself.

Disconnect the power plug before accessing inside the server, or connecting the peripherals.

Make sure to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of the server is off-powered.

Disconnect the power plug from the outlet occasionally and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION

Avoid installation in extreme temperature conditions.

Immediately after the server is powered off, its internal components such as hard disks are very hot. Leave the server until its internal components fully cool down before installing/removing any component.

Make sure to complete board installation.

Always install a board firmly. An incompletely installed board may cause a contact failure, resulting in smoking or fire.

Protect the unused connectors with the protective cap.

The unused power supply cable connectors are covered with the protective cap to prevent short circuits and electrical hazards. When removing the power supply cable connector from the internal devices, attach the protective cap to the connector. Failure to follow this warning may cause a fire or an electric shock.

During Operation

⚠ CAUTION

Stay away from the fan.

Keep your hand or hair away from the cooling fan on the rear of the server. Failure to follow this warning may get your hand or hair caught in the fan, resulting in injury.

Avoid contact with the server during thunderstorms.

Disconnect the power plug from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the power plug, do not touch any part of the server including the cables. Failure to follow this warning may cause a fire or an electric shock.

Keep animals away from the server.

Failure to follow this warning may cause a fire or an electric shock.

Do not place any object on top of the server.

The server may fall and cause property damage to the surroundings.

Do not use a cellular phone or pager around the server.

Turn off the cellular phone or pager. Radio interference may cause malfunctions of the server.

FOR PROPER OPERATION

Observe the following notes for successful operation of the server. Use of the server ignoring the notes will cause malfunctions or failures of the server.

- Install the server in a place that meets requirements for successful operation. For details, see Chapter 3, "Setting Up Your Server."
- Do not delete the hard disk partition exclusively provided for maintenance of the server although it may appear on the OS.
- Make sure to power off the server before connecting or disconnecting cables between the server and peripheral devices.
- Verify that the access lamp on the server is unlit before turning off the server or ejecting the floppy disk.
- The server management logic on your system board monitors and logs system voltage changes. When plugging the power cord to the system, you may experience 10 seconds delay from the time you press the POWER switch on the front panel. This is normal system operation and is required by the server management logic.
- When you have just turned off the server, wait at least 30 seconds before turning it back on.
- Do not turn off the server until characters appear on the screen.
- For the disk which does not conform to the CD standard, the playback of such a disk with the CD drive is not guaranteed.
- Turn off the power and unplug the power cord from the outlet before relocating the server.
- Clean the server on a regular basis. (See Chapter 7 for cleaning.) Regular cleaning proactively prevents various failures of the server.
- Lightning may cause a momentary voltage drop. To prevent this problem, it is recommended to use of an uninterruptible power supply unit.
- Check and adjust the system clock before the operation if any of the following conditions is applicable.
  - After carriage of device
  - After storage of device
  - After the device is entered into the pause state under the environmental condition enduring device operation (temperature: 10°C - 35°C, humidity: 20% - 80%)
- Check the system clock at the rough rate of once per month. When the system clock is installed in a system requiring high time precision, it is recommended to use a time server (NTP server).
  If the system clock is remarkably delayed or advanced as the passage of time in spite of adjustment, contact your sales agent to ask maintenance.
- Store the unit under the storage condition (temperature: –10°C - 55°C, humidity: 20% - 80%, without condensation) to allow built-in devices and the unit to operate correctly in the next operation.
- Make sure to use optional devices supported by the server. Some non-supported devices may be physically installed/connected but cause failures of the server as well as malfunctions of the server.
- NEC recommends you use NEC's genuine products. Some third-party products claim that they support the server. However, repair of the server due to a failure or damage resulted from use of such third-party products will be charged.

TRANSFER TO THIRD PARTY

The following must be observed when you transfer (or sell) the server or software provided with the server to a third party:

Server hardware

Make sure to provide this manual along with the server to a third party.

> **IMPORTANT:** It is the user's responsibility to completely erase or modify all the data stored in storage device such as hard disk so that the data cannot be restored.

Provided software

To transfer or sell any software application that comes with the server to a third party, the following requirements must be satisfied:

- All provided software applications must be transferred and no backup copies must be retained.
- Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
- Software applications that are not approved for transfer must be uninstalled before transferring the server.

DISPOSAL AND CONSUMABLES

- Dispose of the server, all the internal devices, floppy disks, and CD-ROMs according to all national laws and local ordinance.

IMPORTANT:

- For disposal (or replacement) of the battery on the mother board of the server, consult with your sales agent.
- It is the user's responsibility to completely erase or modify all the data stored in storage device such as hard disk so that the data cannot be restored.

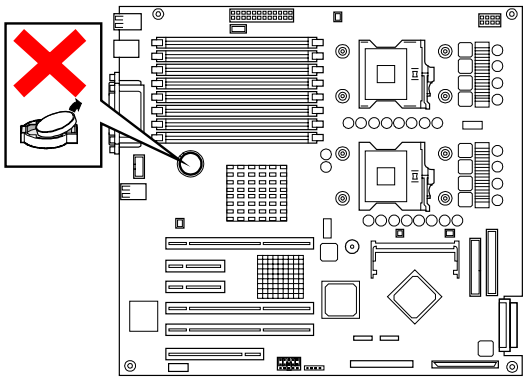
- Your server contains some components that are only good for a limited period of time and require replacement, such as fans, internal batteries, the internal CD-ROM drive, the floppy disk drive, and the mouse. For stable operation of the server, NEC recommends you replace these components on a regular basis. Consult with your sales agent for replacement or the product lives.

⚠ WARNING

Do not remove the lithium battery.

Your contains the lithium battery. Do not remove the battery. Placing the lithium or nickel cadmium battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead lithium battery, contact your sales agent. Do not disassemble the server to replace or recharge the battery by yourself.



Mother board

USER SUPPORT

Before Asking for Repair, do the following when the server appears to fail:

1. Check if the power cord and the cables to other devices are properly connected.
2. See Chapter 8 to find if your problem fits the description. If it does, take the recommended measure for it.
3. Check if the software required for operation of the server is properly installed.

If the server still appears to fail after you have taken the above actions, consult with your sales agent immediately. Take notes on lamp indications of the server and alarm indications on the display unit before consultation, which may provide a significant help to your sale agent.

Advice for Health

The longer you keep using the computer equipment, the more you become tired, which may cause disorders of your body. When you use a computer, observe the following to keep yourself from getting tired:

Good Working Posture

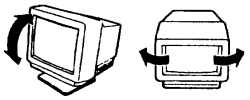
You have good posture if the following are satisfied when you use a computer:

- You sit on a chair with your back straight.
- Your hands are parallel with the floor when you put them on the keyboard.
- You look at the screen slightly lower than your eye height.

You have "good working posture" as described in the above when no part of your body is under excess strain, in other words when your muscles are most relaxed.

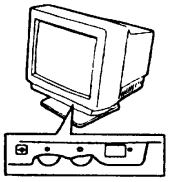
You have "bad posture" when you sit with your back hunched up or you operate a display unit with your face close to the screen. Bad working posture may cause eye strain or poor eyesight.

Adjustment of Display Unit Angles



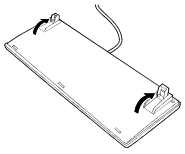
Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. You will not be able to keep "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.

Adjustment of Screen Brightness and Contrast

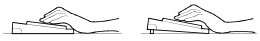


The display unit has brightness and contrast adjustment functions. The most suitable brightness and contrast depend on the individual and the working environment (well-lighted room or insufficient light). Adjust brightness and contrast so that the screen will be easy to see. An extremely bright or dark screen will give a bad effect to your eyes.

Adjustment of Keyboard Angle



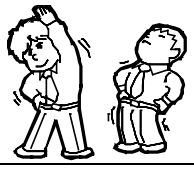
The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



Cleaning of Equipment

Clean equipment regularly. It is difficult to see the display contents on a dusty screen. Keeping equipment clean is also important for your sight.

Fatigue and Rest



If you feel tired, you should stop working and do light exercises.

Chapter 2

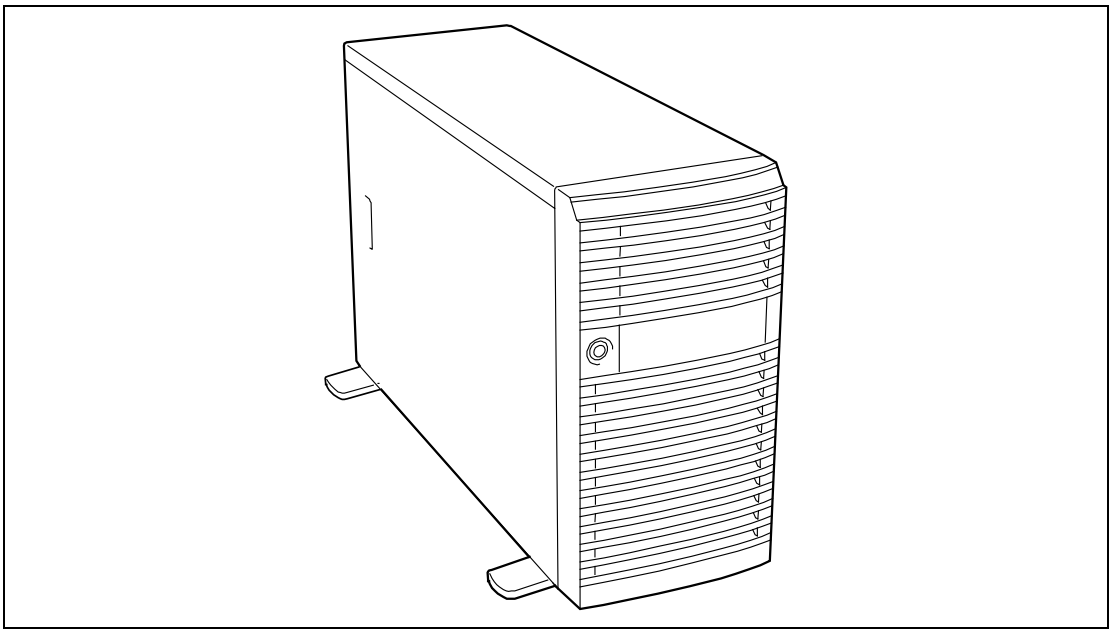
General Description

This chapter provides information that you should be familiar with before using the server. It includes names and functions of the components and features of the server.

OVERVIEW

Your server is a modular, multiprocessing server based on the Intel® Xeon™ microprocessor family. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such a file and print services, e-mail, web access, web site server, etc.

This server is conveniently housed and available as a tower-based system or as a rack-mount system (fits into a standard EIA 19-inch rack assembly).



Tower-based System Front View

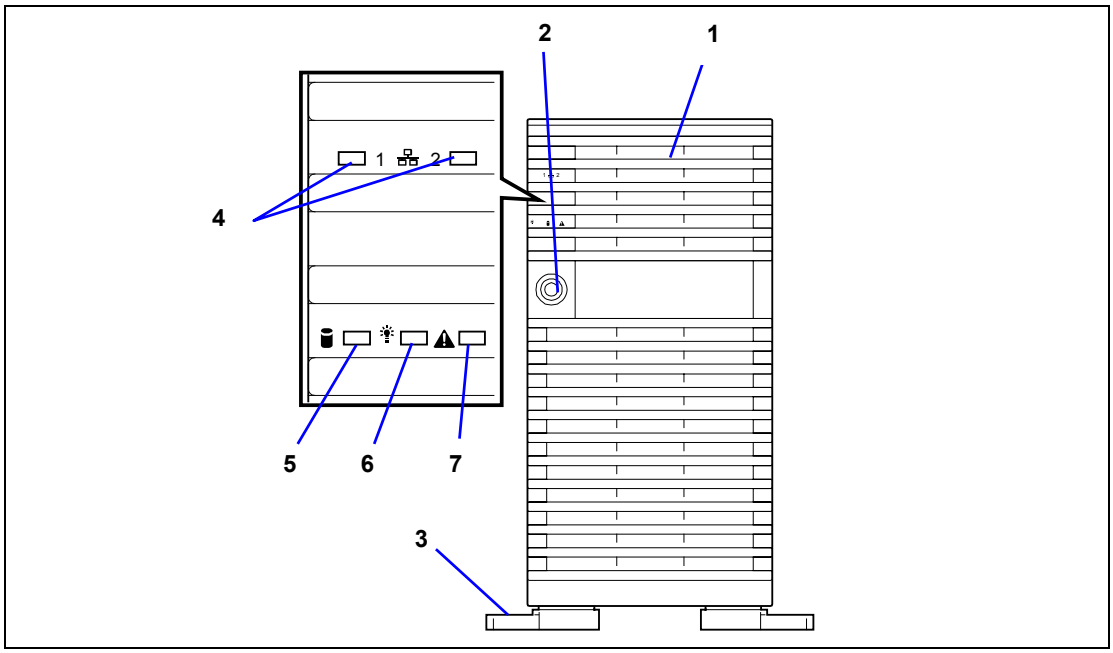
Your server may include hot-swap SCSI hard disk drive bays. The hot-swap SCSI hard disk drive bays hold up to six 1.0-inch SCSI hard disk drives that can be swapped in or out of the system without powering it down, if RAID is configured in the system.

As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards and peripheral devices; tape devices, CD-ROM, and hard disk drives.

SYSTEM CHASSIS

Names and functions of the components are shown below.

Front View



1 Front door
Open this door to access the POWER switch, 5.25-inch devices, the CD-ROM drive, or the floppy disk drive, or to install/remove hard disks to 3.5-inch bays. You can lock the front door using the provided security key.

2 Key lock
When locked, secures the front door not allowing access to the front system controls.

3 Stabilizers (4)
Use the stabilizers to prevent the server from falling down.

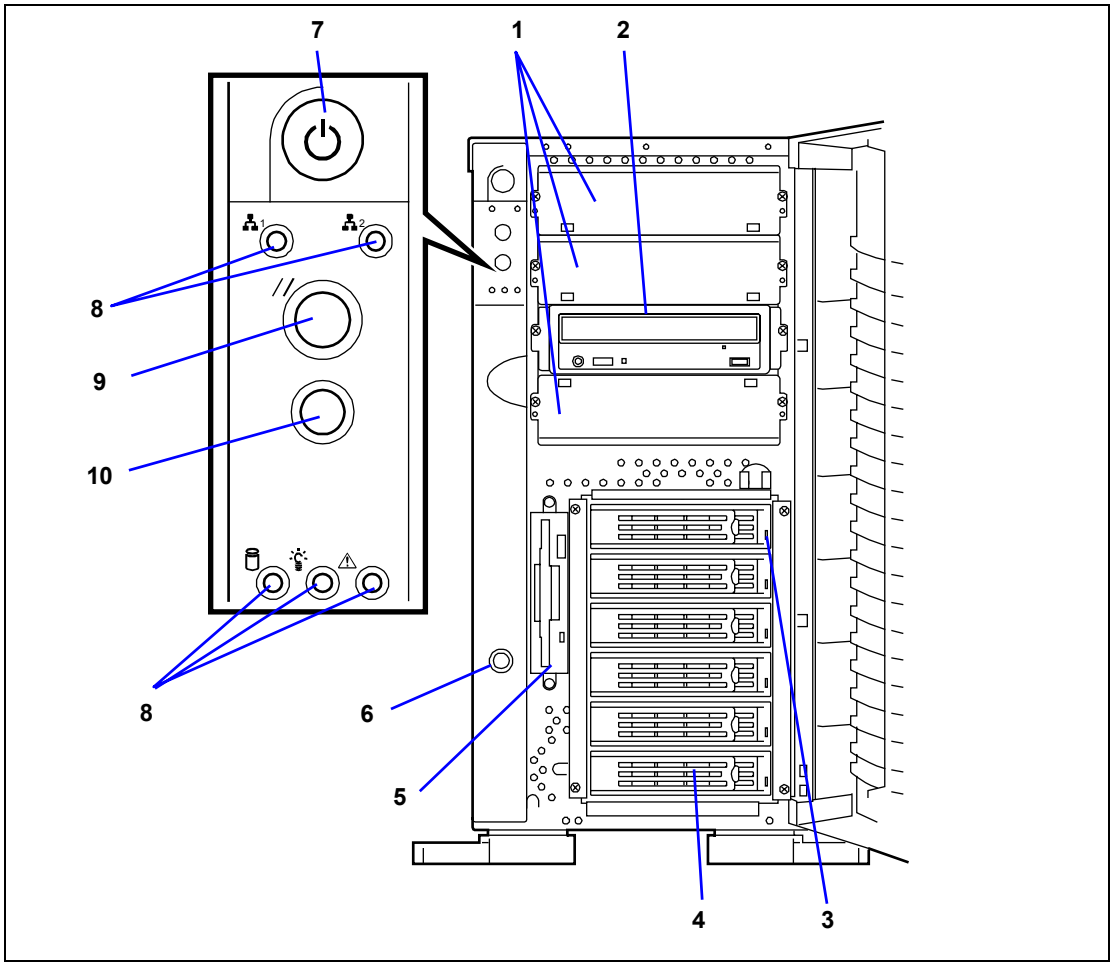
4 LAN ACCESS lamp (green)
Lights in green while the server is connected to the network. Blinking in green indicates the network activity. Numbers printed near the lamps indicate the LAN port number.

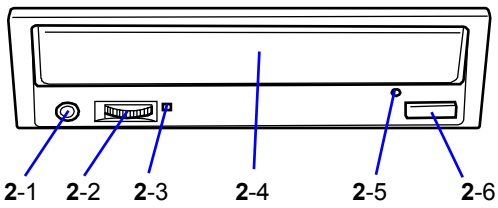
5 DISK ACCESS lamp (green/amber)
Lights in green while the internal hard disk is in access. When any one of the internal hard disks fails, this lamp lights in amber.

6 POWER/SLEEP lamp (green)
Lights in green when the server is powered on. When the server is powered off. Blinks when the system is placed in the sleep mode.

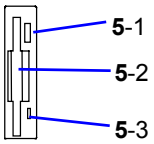
7 STATUS lamp (green/amber)
Lights in green while the server is in successful operation. When any error is detected, this lamp lights in amber.

Front View (Door Opened)





CD-ROM Drive



Floppy Disk Drive

1 5.25-inch device bay

Backup tape drives may be installed in the 5.25-inch device bay.

2 CD-ROM drive

The CD-ROM drive reads data from the inserted CD-ROM. (Depending on your hardware configuration, the DVD-ROM drive may be installed.)

2-1 Headphone jack
2-2 Volume control
2-3 Access lamp (lights in amber while being accessed)
2-4 CD-ROM slot
2-5 Emergency hole
2-6 Open/Close button

3 Disk lamp (green/amber)

The disk lamp is lit green if a hard disk installed in the server is accessed. If a hard disk is defected, the lamp is lit amber. During the rebuild processing, the lamp is lit green or amber alternately. (This occurs only in the disk array configuration.)

4 3.5-inch hard disk drive bay

The 3.5-inch hard disk drive bay contains up to six hard disks. Hard disks having the thickness of 1 inch can be inserted into the slots.
The SCSI IDs are defined as follows:
ID0 to ID5 from bottom to top.

5 3.5-inch floppy disk drive

Insert a 3.5-inch floppy disk to the 3.5-inch floppy disk drive to read data from the disk or write data to the disk.

5-1: Eject button
5-2: Disk inserting section
5-3: Floppy disk access lamp (lit green during accessing)

6 Cover open sensor

The cover open sensor detects the open of the front door.

7 Power switch

The power switch is used to turn on/off the power. If you press the switch once, then the POWER/SLEEP lamp goes on and the power is turned on. If you press the switch again, the power is turned off. The system is forcibly shut down when the power switch is pressed continuously for four seconds or longer.

8 Lamps (see the figure on the previous page)

9 Reset switch

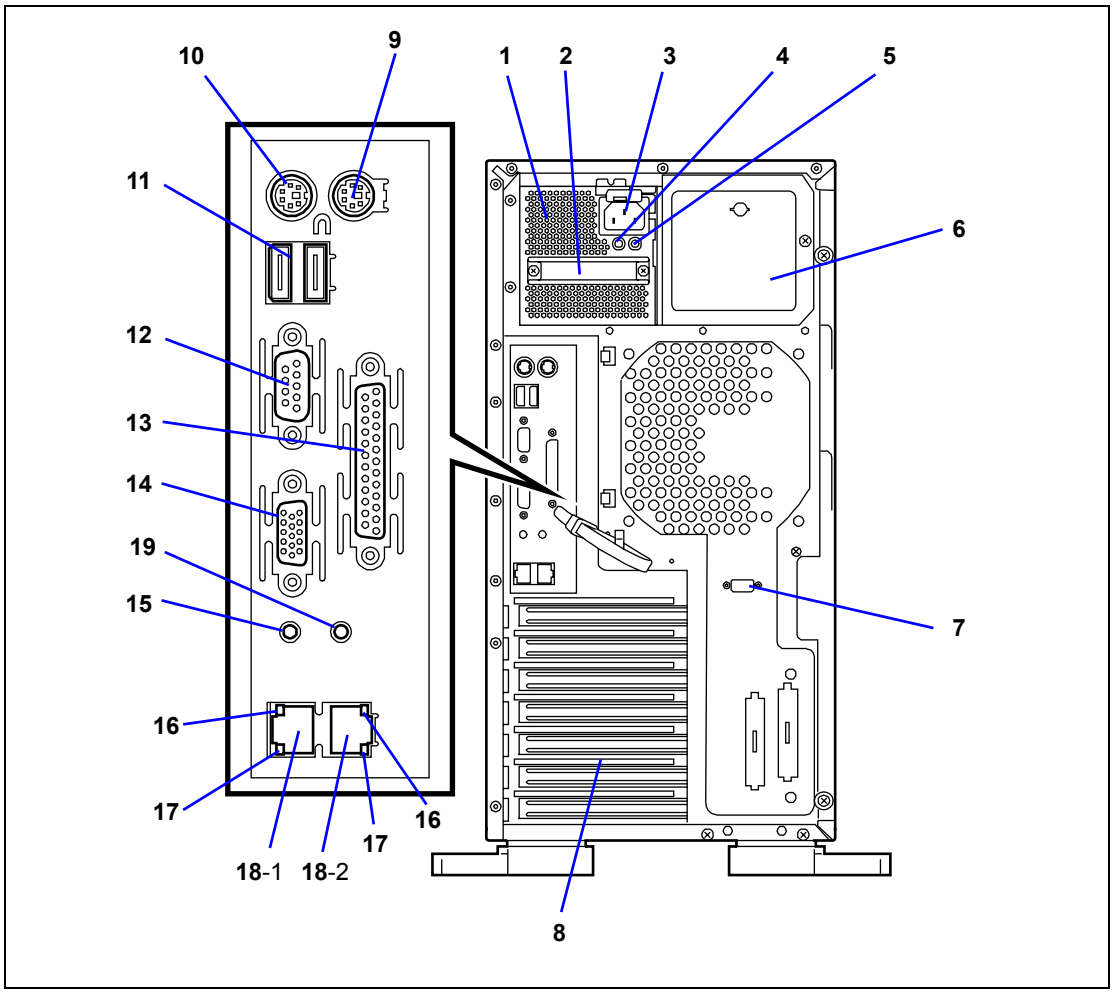
The reset switch is used to reset the server.

10 Dump switch (NMI switch)

Non-maskable Interrupt switch.
The dump switch is used to collect the event logs having occurred in the server.

Rear View

The following figure shows the redundant hot-plug power supply model. For the non-redundant power supply model (fixed power supply is installed), you cannot find the items 2, 4, 5, and 6.



1 Power supply
The power unit supplies DC powers to the server.

2 Handle
Grasp this handle install or remove the power supply.

3 AC inlet
The AC inlet is connected with the power cord.

4 Power lamp
The Power lamp blinks green if the power supply receives the AC power through the power cord. The lamp goes on green when the power of the server is turned on.

5 Power fail lamp
The amber lamp goes on if the power is defected.

6 Additional power supply slot
An optional power supply may be installed on the slot.

7 Serial port B connector
The serial port B connector is used to connect the server to a device with the serial interface. The server cannot be directly connected to a leased line through the connector.

8 Additional PCI board slots
Optional PCI boards may be inserted into the slots.

9 Mouse connector
The mouse connector is connected with the mouse coming with the server.

10 Keyboard connector
The keyboard connector is connected with keyboard coming with the server.

11 USB-1 and USB-2 connectors
The USB-1 and USB-2 connectors are connected with devices accepting the USB interface. Connector 1 to connector 3 are assigned from right to left.

12 Serial port A connector
The serial port A connector is connected with a device having the serial interface.

13 Printer port connector
The printer port connector is connected with a printer with the Centronics interface.

14 Monitor connector
The monitor connector is connected with the display unit.

15 Unit ID switch
Not used in this system.

16 Link/ACT lamp
The Link/ACT lamp shows the LAN access status.

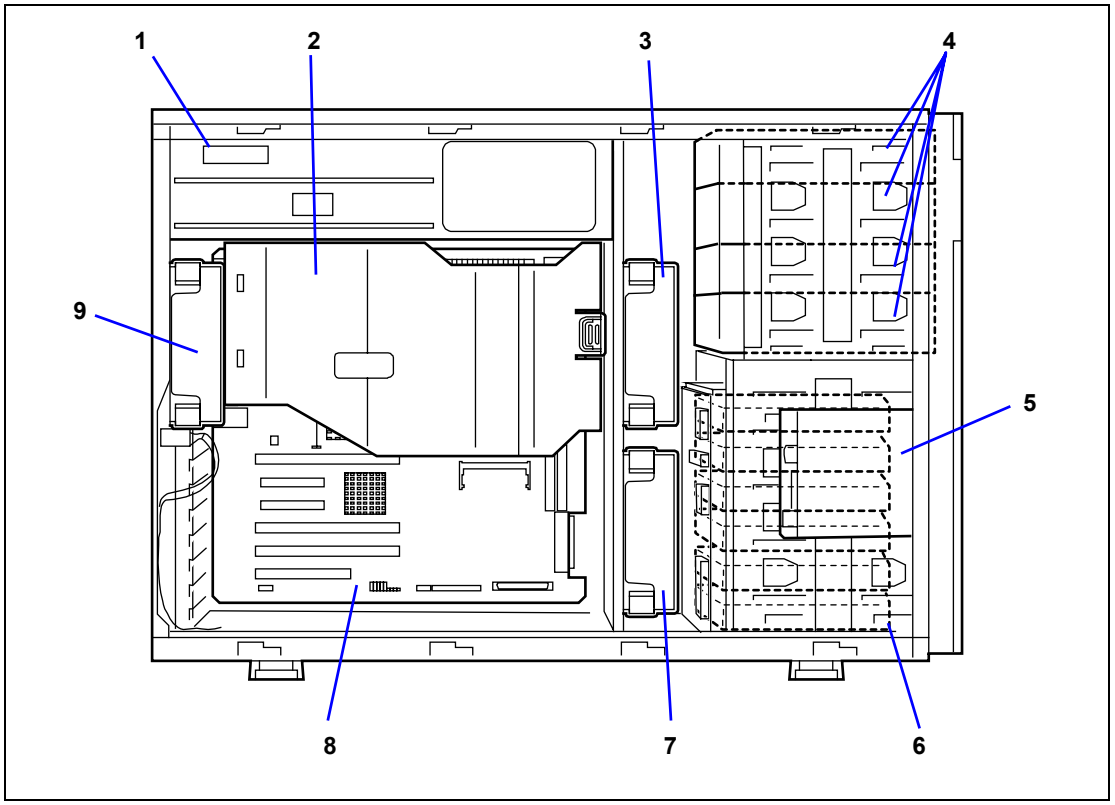
17 Speed lamp
Indicates the LAN transfer rate.

18 LAN connector(s)
The LAN connectors are connected with a network system on LAN. The value following the bold-faced number indicates the port number.
Your server supports 1000BASE-T/100BASE-TX/10BASE-T network subsystem.

19 Dump switch (NMI switch)
Pressing this switch to dump system memory.

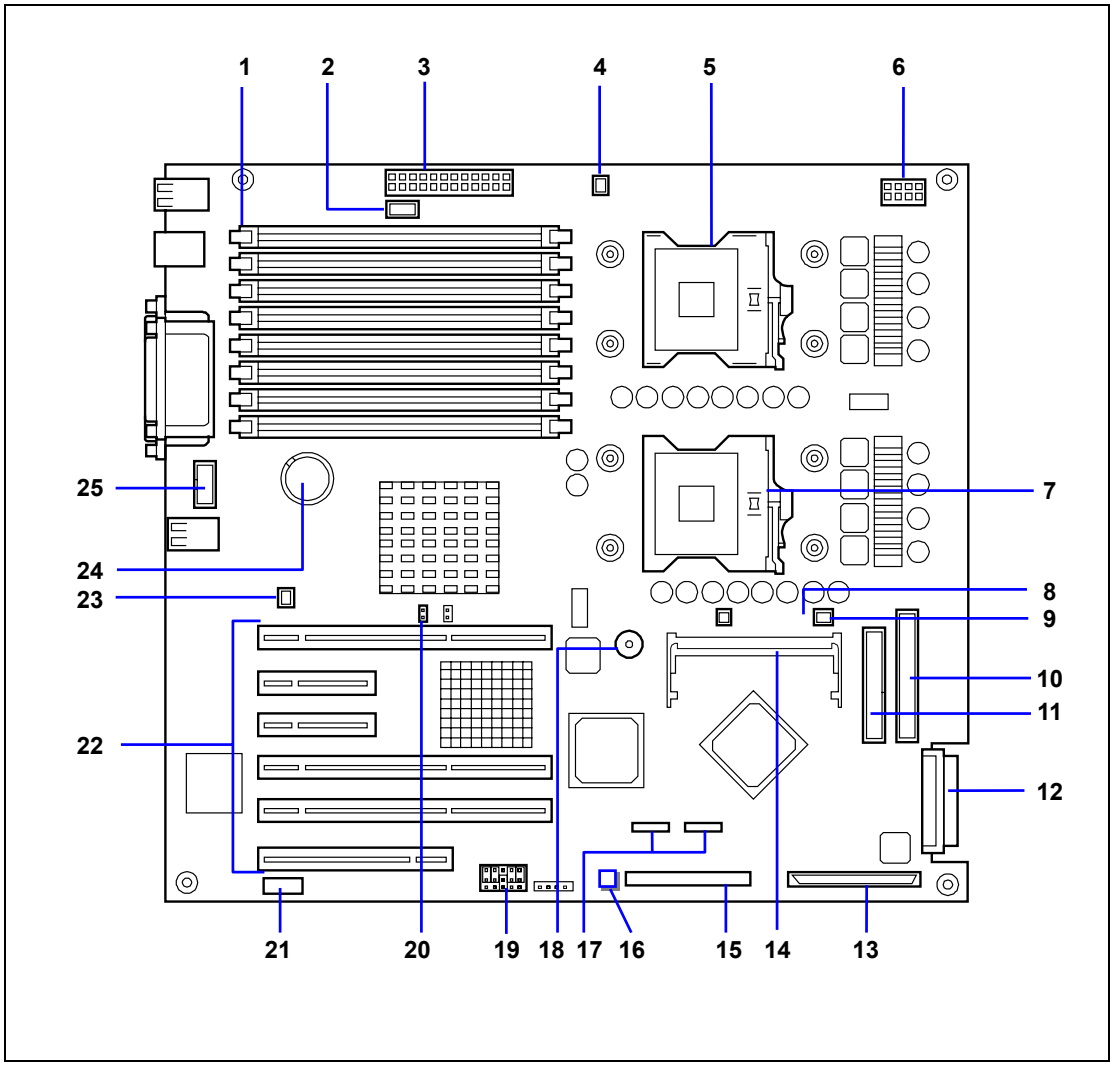
Internal View

The following figure shows an internal view of your system.



1 **Power supply**
2 **Air duct**
3 **Front cooling fan (Fan 3)**
4 **5.25-inch device bays (4 slots)**
A standard CD-ROM drive is installed in slot #3.
5 **3.5-inch floppy disk drive**
6 **3.5-inch hard disk drive bay**
The hard disk drive bay can hold up to six 1.0-inch hot-swap SCSI hard disk drives.
7 **Cooling fan (Fan 2: option)**
8 **Mother board**
9 **Rear cooling fan (Fan 5)**

MOTHER BOARD



1 DIMM sockets (slots 1 to 8 from top to bottom)

2 Power signal connector (redundant hot-plug power supply only)

3 Power connector

4 Front cooling fan connector (Fan 3)

5 Processor 1 socket

6 Power connector

7 Processor 2 socket

8 Cooling fan signal connector (Fan 2: option)

9 Cooling fan connector (Fan 2: option)

10 IDE connector (for CD-ROM drive)

11 Floppy disk drive connector

12 Ultra320(B) connector (for internal file devices)

13 Ultra320 (A) connector (for built-in hard disk)

14 Remote management card slot

15 Front panel interface connector

16 USB connector

17 Serial ATA connectors

18 Speaker

19 Jumper switch for clearing CMOS

20 Jumper switch for clearing BIOS password

21 Chassis intrusion connector

22 PCI board slots
(slots PCI #1, PCI #2, PCI #3, PCI #4, PCI #5, and PCI #6 arranged from bottom to top)
PCI #6: 64-bit, 133MHz, PCI-X
PCI #5, #4: PCI EXPRESS (8-bus)
PCI #3, #2: 64-bit, 100MHz, PCI-X
PCI #1: 32-bit, 33MHz, PCI

23 Rear cooling fan connector (Fan 5)

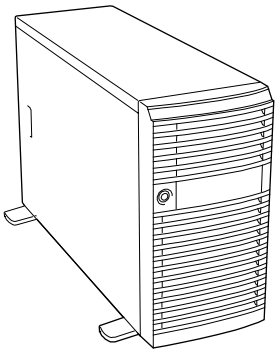
24 Lithium battery

25 Serial (COM B) connector

STANDARD FEATURES

High performance

- Intel® Xeon™ 3DGHz or 3.4GHz Processor
- High-speed 1000BASE-T/100BASE-TX/ 10BASE-T interface (1000Mbps/100Mbps/10Mbps supported)
- High-speed disk access (Ultra320 SCSI)
- USB 2.0



High-reliability

- Memory monitoring feature (single-bit error correction/double-bit error detection)
- CPU/memory/cooling fan degradation feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error notification
- Internal CPU fan monitoring feature
- Internal voltage monitoring feature
- BIOS password feature
- Security feature (security lock)
- Redundant power supplies (1+1)*
- Onboard SCSI RAID controller (HostRAID)

Management Utilities

- NEC ESMPRO
- NEC DianaScope

Power Saving Feature

- Sleep feature (available for Windows 2000/2003)

Expandability

- Wide variety of optional I/O slots
  Two PCI EXPRESS (8-bus) slots
  One 64-bit, 133MHz PCI-X slot
  Two 64-bit, 100 MHz PCI-X slots
  One 32-bit, 33 MHz PCI slot
- 512MB to 16GB of DDR333 SDRAM two way interleaved memory, using up to eight DIMMs
- Six SCSI hard disk drive bays (hot-swappable)
- Remote power-on feature
- Up to two Intel Xeon processors
- Two hot-plug power supplies (Redundancy)*
- USB interface (A USB-support driver is required.)
- Convert to rack-mount type (N8143-56F Rack Conversion Kit is required.)

Many Available Features

- Graphic accelerator "RADEON7000" support
- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-LINK feature
- Intelligent Platform Management Interface (IPMI)
- Remote Management Card (option)
- Remote console feature

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis

Maintenance Features

- Off-line Maintenance Utility
- Memory dump feature using the DUMP (NMI) switch

Easy and Fine Setup

- NEC EXPRESSBUILDER (system setup utility)
- SETUP (BIOS SETUP utility)
- SCSI*Select* (SCSI device and HostRAID utility)
- Configuration Diskette Creator

* Only for models N8100-942F/943F.

SYSTEM FUNCTIONS

The following subsections describe system functions.

Degradation Feature

The degradation feature automatically isolates a failed DIMM or processor to assure continuous operation of the server when the POST (Power On Self-Test, self-diagnosis program after power on) detects such a DIMM or processor.

Failed DIMMs and processors may be identified on the screen that the POST displays, or with the BIOS setup utility, "SETUP." They may also be identified on the system that has the NEC ESMPRO installed.

Remote Power-On Feature (Wake On LAN)

The remote power-on function turns on the server through a network. It sends a special packet from the management computer to a remote server to turn it on if the server is off-powered.

To enable this feature, use the BIOS setup utility, "SETUP." (See Chapter 4.)

The remote power-on feature is not available in the following cases. Press the POWER switch once to start the OS, and turn off the server in an appropriate procedure.

- Abnormal previous system shut-down
- No power supply to the server (due to turned-off breaker, disconnected power cord, power blackout, etc.)

AC-LINK Feature

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC-LINK feature can be enabled or disabled with the Server menu of the BIOS setup utility, "SETUP." (See Chapter 4.)

Remote Management Card (RMC)

Server management is concentrated in the optional Remote Management Card (RMC). The RMC and associated circuitry are powered from a 5Vdc standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The RMC supports the NEC DianaScope, which allows remote server management via a modem or direct connection to a manager system. Events monitored by the manager system include over-temperature and over-voltage conditions, fan failure, or chassis intrusion.

Information on NEC DianaScope may be found in the NEC EXPRESSBUILDER CD-ROM.

One major function of the RMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include overtemperature and overvoltage conditions, fan failure, or chassis intrusion. To enable accurate monitoring, the RMC maintains the nonvolatile Sensor Data Records (SDRs), from which sensor information can be retrieved. The RMC provides an ISA host interface to SCR sensor information, so that software running on the server can poll and retrieve the server's current status.

The RMC performs the following:

- Monitors server board temperature and voltage*
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure*
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL teimestamp clock
- Monitors the system management watchdog timer
- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking, diskette write-protect monitoring, and front panel lock/unlock initiation
- Controls Wake On LAN via Magic Packet support.

*Also, NEC ESMPRO supports these features.

SECURITY

To help prevent unauthorized entry or use of the system, the system includes a full lockable front panel and Server Management software that monitors the system intrusion switches.

Security with Mechanical Locks and Monitoring

The front door of the server contains a mechanical lock to prevent access to the front of the computer chassis.

The computer chassis includes an intrusion switch for the front cover and intrusion/interlock switches for the left side cover (as viewed from the front). When any these covers are opened, the switch transmits an alarm signal to the system board, where server management software processes the signal. The side cover switch also operates as interlock switch.

Software Locks via the System Setup Utility

The BIOS SETUP Utility provides a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, access to the system is allowed only after the user enters the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time-out period – 2 to 120 minutes.
- Set and enable an administrative password.
- Set and enable a user password
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot-key combination to enter secure mode quickly.
- Disable writing to the floppy disk drive when secure mode is set.

NEC EXPRESSBUILDER

The CD-ROM that comes with your server contains a setup utility called "NEC EXPRESSBUILDER." When you have first installed the server or append features to the server, use the NEC EXPRESSBUILDER to set up your server.

Refer to Chapter 6 for details.

The major functions of the NEC EXPRESSBUILDER are:

- To install the OS.
  It installs an operating system.
- To diagnose the system.
  It diagnoses the server.
- To create a support disk.
  It copies utilities in the NEC EXPRESSBUILDER CD-ROM into a floppy disk to launch them from the floppy disk.
- To update the BIOS
  It updates the BIOS features of the server.
- To update the Windows System*
  It updates the several resources of Microsoft Windows Server 2003, Microsoft Windows 2000.
- To install the utilities*
  It install the management utilities of NEC ESMPRO and NEC DianaScope.
- To read the online documents*
  It opens the online document files (".pdf" files).

  * These functions are available under Windows system.

NOTE: Some features among those listed above can be used from the remote computer via cross cable, modem, or LAN (remote console). See Chapter 6 for details.

NEC ESMPRO

The NEC ESMPRO is server management software that runs on the OS. The NEC ESMPRO includes the NEC ESMPRO Manager for the server monitoring terminal and the NEC ESMPRO Agent for the NEC Express server.

> **NOTE:** For details of major functions of the NEC ESMPRO, system configuration and setups with the NEC ESMPRO, see Chapter 6. Available functions of the NEC ESMPRO depend on the OS you install. Ask your sales agent for details.

Off-line Maintenance Utility

The Off-line Maintenance Utility is used for proactive maintenance and fault analysis of the server. Normally this utility is used by the maintenance engineer.

Refer to Chapter 8 for details.

System Diagnostic Utility

The system diagnostic utility contained in the NEC EXPRESSBUILDER is useful to prevent the hardware failures. See Chapter 7 for details.

NEC DianaScope

The NEC DianaScope is a software for the remote management of the NEC Express5800 series. The NEC DianaScope can control the managed server even if OS is not running on the managed server. To use the NEC DianaScope, you need to purchase the separately priced server license.

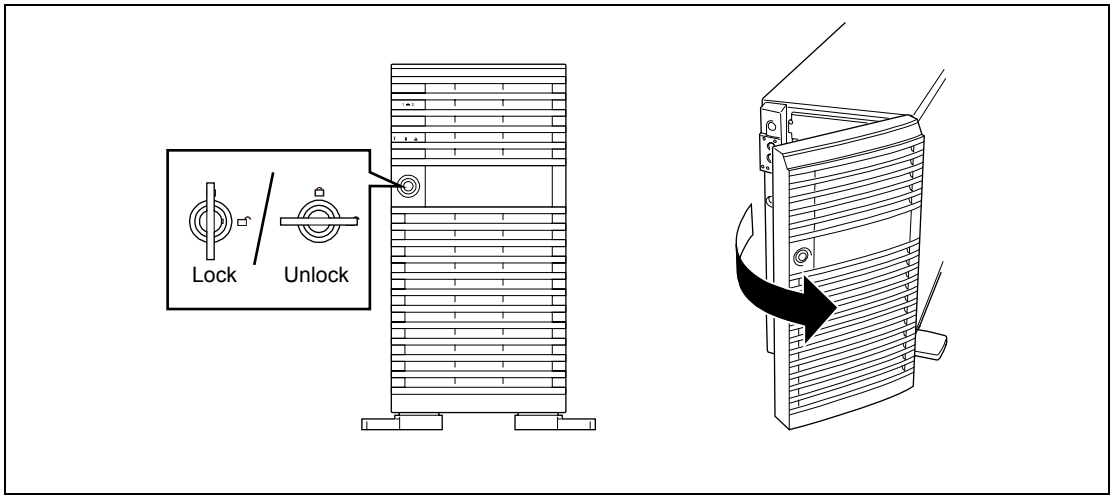
See Chapter 6 and online document in the NEC EXPRESSBUILDER.

USING NEC EXPRESS SERVER

This section describes basic operations of your server including how to use devices such as the floppy disk drive and the CD-ROM drive. See Appendix B for notes on using the floppy disk, CD-ROM, and accessories including the keyboard and the mouse.

Front Door

Open the front door to power on/off the server, to access the floppy disk drive, CD-ROM drive, and 5.25-inch devices, and to install/remove hard disks to the 3.5-inch device bays.



IMPORTANT: To open the front door, you must unlock the door with the provided security key.

Insert the provided security key into the key hole and turn the key to unlock the front door. Then, hold the front door edges and gently pull the door away from the computer chassis. When you close the front door, lock the door with the key for security.

IMPORTANT: Do not open the front door by hanging the handle at the upper left corner with your claws. If the front door cannot be opened easily, hold the upper left and lower left corners of the front door with your hands and then pull it out toward you.

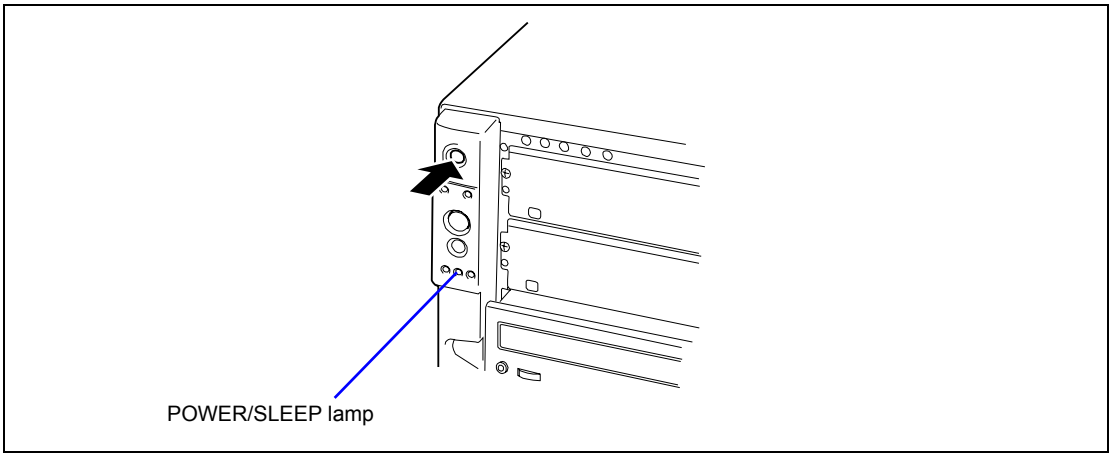
POWER Switch

Use the POWER switch to turn on/off the server.

Power On

Press the POWER switch on the front of the computer chassis.

The POWER/SLEEP lamp lights in green.



IMPORTANT:

- If the power cord is connected to a power control device such as a UPS (Uninterruptible Power Supply), make sure that the power control device is powered.
- If the power cord is connected to the server, an initial diagnosis of the hardware starts. The POWER switch does not work while in diagnosis. Wait for about 10 seconds, then press the POWER switch.
- Always allow POST to complete before powering down your system (see the next subsection for POST).

POST

POST (Power On Self-Test) is the self-diagnostic program stored in the system memory.

When you power on the server, the system automatically runs POST to check the mother board, ECC memory module, CPU module, keyboard, and mouse. POST also displays messages of the BIOS setup utility, such as the start-up message, while in progress.

With the factory setup of the server, the NEC logo appears on the display unit while POST is in progress. (To display the POST check results, press **Esc**.)

> **NOTE:** You can set the POST check results to appear on the display unit without pressing **Esc**. To do so, select "Enabled" for "Boot-time Diag Screen" under the Advanced menu of the BIOS setup utility.

The POST check results should be checked in the following cases.

- When the server is used for the first time.
- When the server appears to fail.
- When the server beeps for many times between power-on and OS start-up.
- When an error message appears on the display unit.

POST Execution Flow

The following describes the progress of POST in the chronological order.

IMPORTANT:

- Do not make key entries or perform mouse operations while POST is in progress.
- Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.
- Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST. In such a case, press **F1** to continue POST. Board configuration can be made using the utility described later.

1. After a few seconds from power-on, POST starts checking the memory. The count message of the basic and expansion memory appears at top left on the display unit screen. The memory check may takes a few minutes to complete depending on the memory size of the server. Also, it may take approximately one minute for the screen display to appear after rebooting the server.
2. Some messages appear upon completion of the memory check. These messages appear to indicate that the system has detected the CPU, keyboard, and mouse.
3. POST then detects the internal SCSI controller and display the message prompting you to launch the SCSI device utility. (Ignore the message. POST will automatically proceed a few seconds later.)

   ```
   Press <Ctrl> <A> for SCSISelect(TM) Utility!
   ```

   To launch the SCSI device utility, press **Ctrl** and **A**. See Chapter 4 for setup and parameters.

   You need to use the SCSI device utility in the following cases:

   - When new SCSI device is installed in a 5.25-inch device bay.
   - When an external SCSI device connection is changed.
   - When the internal SCSI device connections is changed.
   - When the internal hard disk drives are configured with HostRAID.

   The server automatically restarts POST all over again when you exit the SCSI device utility.

   When multiple SCSI controller boards are connected to the PCI bus of the server, the start-up message of the SCSI device utility is displayed for each board in the order of onboard SCSI, PCI #1, PCI #2, PCI #3, PCI #4, PCI #5 and PCI #6.

4. POST displays SCSI ID numbers used by the connected SCSI devices on the screen.

5. After a few seconds, POST displays the following message prompting you to launch the BIOS setup utility, SETUP, stored in the system memory of the server. This message appears at bottom left on the screen.

   ```
   Press <F2> to enter SETUP
   ```

   Launch the BIOS setup utility when you need to change the settings to meet the requirements for the server. As long as the above message is not displayed with an error message, you don't have to launch the utility. (Ignore the message. POST will automatically proceed.)

   To launch the SETUP utility, press **F2** while the above message is displayed. See Chapter 4 for setup and parameters.

   The server automatically restarts POST all over again when you exit the SETUP utility.

6. If the server has an optional disk array controller installed, POST displays the message prompting you to launch the RAID configuration utility and the disk array BIOS setup utility.

   Refer to the manual supplied with the disk array controller for detail instructions.

   POST will automatically proceed a few seconds later.

7. If you set a password using the BIOS setup utility, SETUP, the password entry screen appears upon successful completion of POST.

   Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

   IMPORTANT: Do not set a password before installing an OS.

8. The OS starts when POST completes.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. See Chapter 8 for POST error codes.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your sales agent. Alarm messages are useful information for maintenance.

Power Off

Follow the procedure below to power off the server. If the power cord of the server is connected to a UPS, refer to the manual that comes with the UPS or the manual for the application that controls the UPS.

> **IMPORTANT:** Always allow POST to complete before turning off the server.

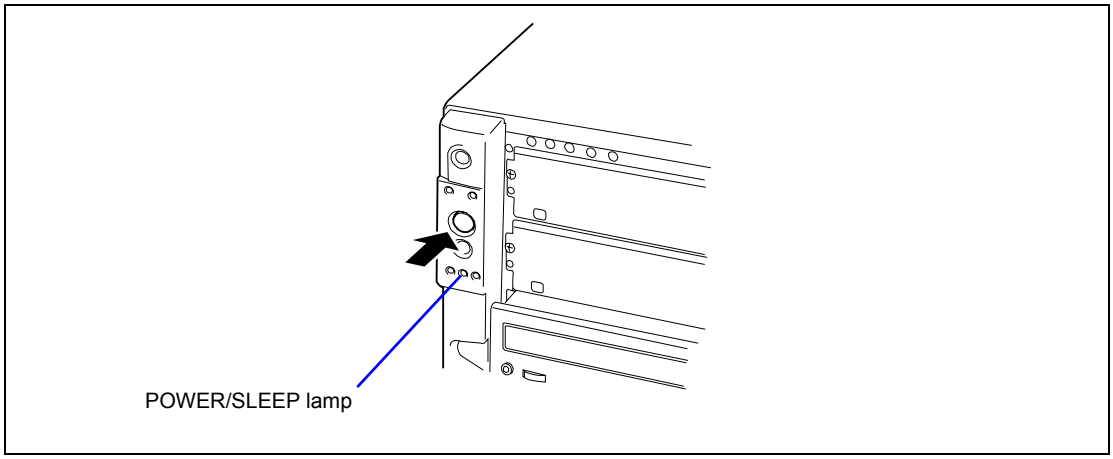
1. Shut down the OS.
2. Press the POWER switch on the front of the server.
   The POWER/SLEEP lamp goes off.
3. Power off peripheral devices.

SLEEP Switch

You can use the POWER switch as the SLEEP switch if the ACPI compliant operating system is installed in your system.

The SLEEP switch allows you to save almost all power of the server (power-saving mode or sleep mode).

NOTE: To use the SLEEP switch, an OS supporting the sleep feature is required. (Available for Windows 2000.)



Press the SLEEP switch on the front of the server to place the server in the power-saving mode. (The POWER/SLEEP lamp blinks.) In the power-saving mode, the server retains the memory data and the status of the previous operations.

To resume the original state, press the POWER switch. (It may take a little time to resume the original state.)

NOTE: The operational level in the power-saving mode depends on the OS in use. (Available for Windows Server 2003 and Windows 2000.)

IMPORTANT: Do not change system configuration while turning into the power-saving mode or in the power-saving mode. Otherwise, you may fail to resume the original state.

Floppy Disk Drive

Your server is provided with the 3.5-inch floppy disk drive on its front to write/read data to/from a floppy disk.

Your server supports the following 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
  Store data of 720KB.

Make sure that the server is powered (the POWER/SLEEP lamp is lit) before inserting a floppy disk into the floppy disk drive.

When you completely insert the floppy disk into the floppy disk drive, the drive clicks and the eject button on the floppy disk is slightly pushed out.

NOTES:

- You cannot use a 1.2MB-formatted floppy disk to boot the system.
- When an unformatted floppy disk is inserted, the message notifying that date read is not available and the message prompting formatting are displayed. Refer to the manual that comes with the OS to format the floppy disk.
- If the floppy disk contains a system, powering on or restarting the server with the floppy disk inserted boots the system from the floppy disk.

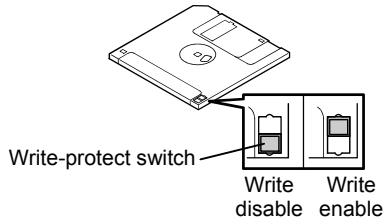
To eject the floppy disk from the floppy disk drive, press the eject button.

NOTE: Make sure that the floppy disk access lamp is unlit before ejecting the floppy disk. Ejecting the disk when the access lamp is lit may destroy the disk data.

NOTE: Use of the floppy disk

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently as far as it goes.
- Attach the label to the correct position.
- Do not write anything directly onto the disk surface with a pencil or ball-point pen.
- Do not open the shutter.
- Do not use the floppy disk in a dusty place.
- Do not place anything on the floppy disk.
- Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- Keep the floppy disk away from cigarette smoke.
- Keep the floppy disk away from any liquid (e.g., water) and chemicals.
- Keep the floppy disk away from any magnetic objects (e.g., magnet).
- Do not pinch the floppy disk with a paper clip or drop it.
- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.
- A floppy disk has a write-protect switch that prevents the stored data from accidental erasure. You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. NEC recommends that you should write-protect any floppy disk containing valuable data unless you are about to save data. To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.



- The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or sever failures, may cause loss of data. To avoid loss of data, NEC recommends that you should make a back-up copy of your valuable data on a regular basis. (Make sure to make a back-up copy of every floppy disk provided with the server.)

CD-ROM Drive

Your server is provided with the CD-ROM drive on its front to read data from a CD-ROM (read-only compact disk). The CD-ROM provides larger and faster data read than the floppy disk.

NOTE: Depending on your order, the DVD-RAM drive may be installed at the factory.

⚠ CAUTION

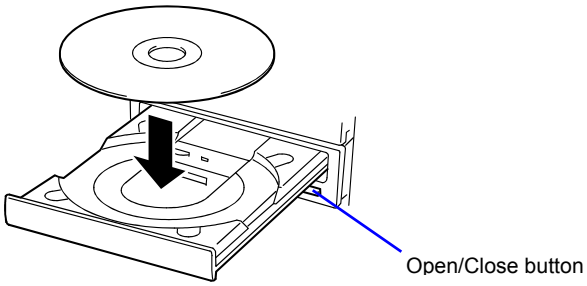
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not leave the tray ejected from the CD-ROM drive.

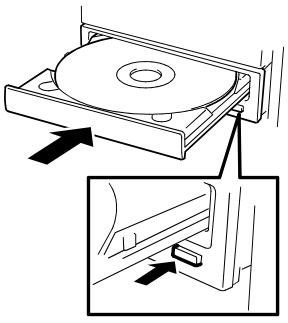
Setting and Removing the CD-ROM

Make sure that the server is powered (the POWER/SLEEP lamp is lit) before inserting a CD-ROM into the CD-ROM drive.

Press the Open/Close button on the front of the CD-ROM drive to eject the tray. With the CD-ROM label facing up, place a CD-ROM in the tray gently and securely.



Press the Open/Close button or gently push on the tray front. The tray is automatically retracted into the CD-ROM drive.



IMPORTANT: If the CD-ROM drive produces large noise after the setting of a CD-ROM, re-set the CD-ROM.

To remove a CD-ROM, press the Open/Close button to eject the tray, as described for inserting it, and then take the CD-ROM out of the tray. (The orange-lit access lamp indicates ongoing disk access. The Open/Close button does not work while the lamp is lit.)

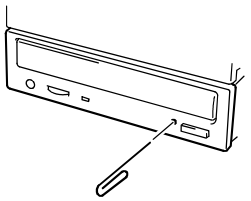
Your OS may have a command to eject the tray.

When you have taken out the CD-ROM, retract the tray back in place.

When you fail to eject:

When you fail to eject the CD-ROM tray with the Open/Close button and take out the CD-ROM from the server, follow the procedure below.

1. Press the POWER switch to power off the server. (The POWER/SLEEP lamp goes off.)
2. Insert a metal pin of approximately 1.2 mm in diameter and 100 mm in length (a straightened large paper clip will make a substitute) into the emergency hole on the right front of the CD-ROM drive and gently push it in until the tray is ejected.



IMPORTANT:

- Do not use a toothpick or plastic stick that is easy to break.
- If the above procedure does not let you take out the CD-ROM, contact your sales agent.

3. Hold the tray and pull it out.
4. Take out the CD-ROM.
5. Push the tray back into position.

Use of the CD-ROM

Keep the following notes in mind to use the CD-ROM for the server:

- For the disk which does not conform to the CD standard, the playback of such a disk with the CD drive is not guaranteed.
- Do not drop the CD-ROM.
- Do not place anything on the CD-ROM or bend the CD-ROM.
- Do not attach any label onto the CD-ROM.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the CD-ROM with its printed side upward and gently put it on the tray.
- Do not scratch the CD-ROM or write anything directly on it with a pencil or ball-point pen.
- Keep the CD-ROM away from cigarette smoke.
- Do not leave the CD-ROM in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are attached on the CD-ROM, wipe the CD-ROM from its center to edge with a dry soft cloth slowly and gently.
- Use the CD cleaner to clean the CD-ROM. Do not use record spray/cleaner, benzene, or thinner.
- Keep the CD-ROM in a CD-ROM case when not in use.
- If the CD-ROM emits large noise in the CD-ROM drive, remove the CD-ROM and insert it back again.

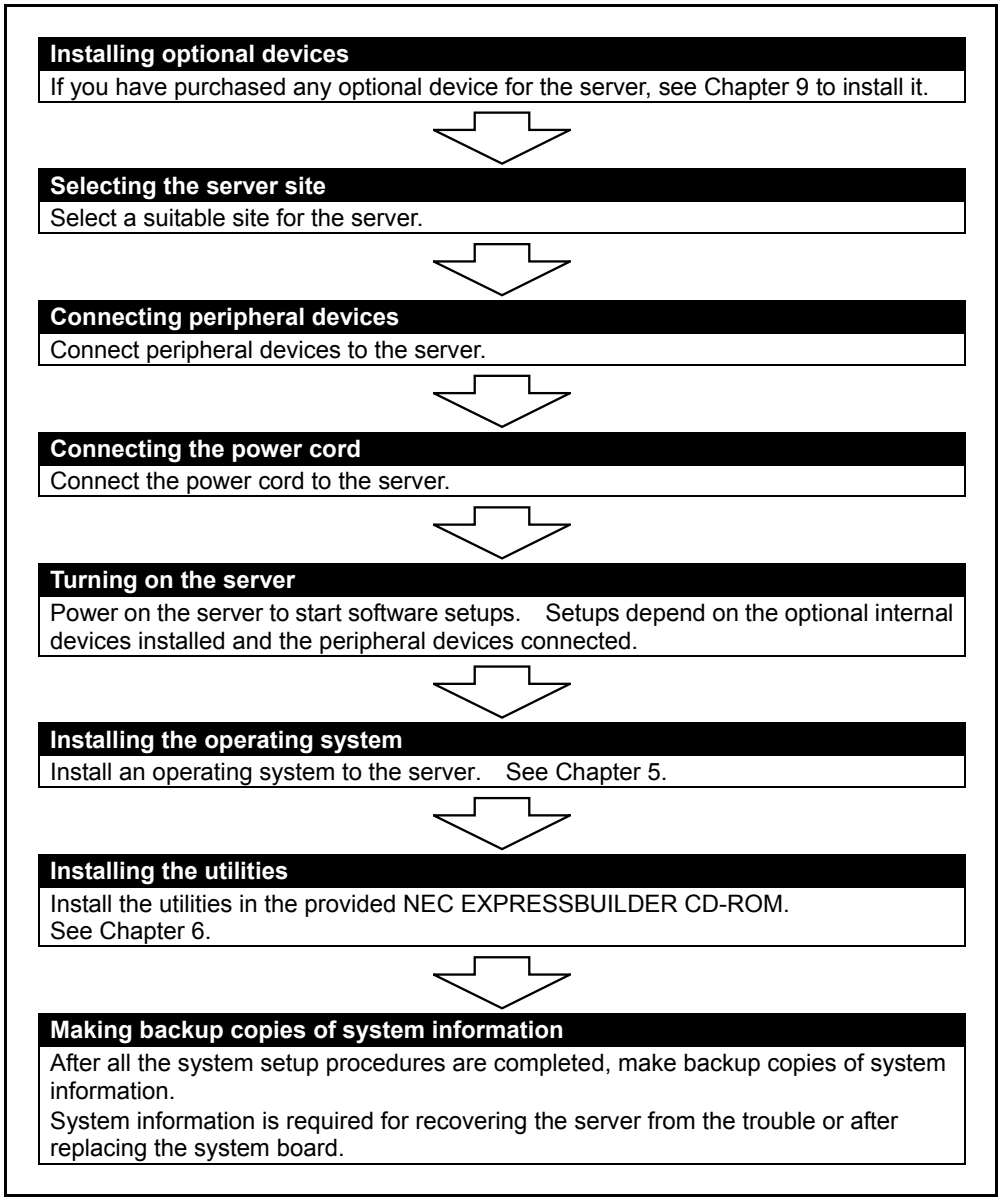
Chapter 3

Setting Up Your Server

This chapter describes how to set up your server appropriate for your system, on a step-by-step basis.

SETUP FLOW

Follow the flowchart below to set up the server.


Installing optional devices
If you have purchased any optional device for the server, see Chapter 9 to install it.
Selecting the server site
Select a suitable site for the server.
Connecting peripheral devices
Connect peripheral devices to the server.
Connecting the power cord
Connect the power cord to the server.
Turning on the server
Power on the server to start software setups. Setups depend on the optional internal devices installed and the peripheral devices connected.
Installing the operating system
Install an operating system to the server. See Chapter 5.
Installing the utilities
Install the utilities in the provided NEC EXPRESSBUILDER CD-ROM.
See Chapter 6.
Making backup copies of system information
After all the system setup procedures are completed, make backup copies of system information.
System information is required for recovering the server from the trouble or after replacing the system board.

INSTALLING OPTIONAL DEVICES

To install any optional device, see Chapter 9, "Upgrading Your Server," for the installation procedure. Proceed to the next section if you have no optional devices to install.

IMPORTANT: There are third-party products (memory modules, hard disks, etc.) available for the server in the markets. However, NEC recommends that you should use NEC products for stable operation. NEC assumes no liability for data errors and failures due to malfunction of the server resulted from installation of those third-party products.

SELECTING SERVER SITE

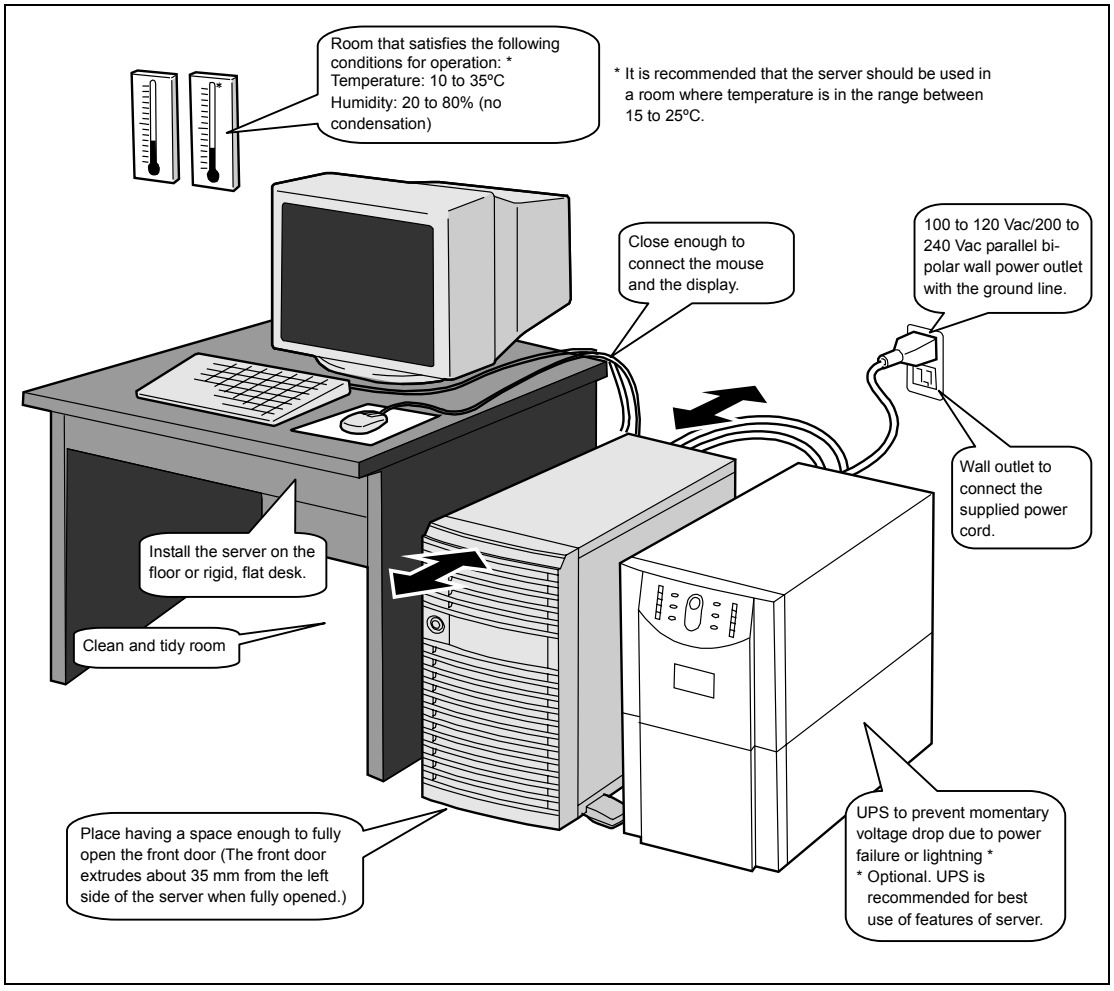
Read the following precautions before selecting a suitable site for your server. The following describes installation of the server and connections to the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Never attempt to lift the server only by yourself.
- Do not install the server in any place other than specified.

The following figure illustrates a site suitable for installing the server.


Room that satisfies the following conditions for operation: *
Temperature: 10 to 35ºC
Humidity: 20 to 80% (no condensation)
* It is recommended that the server should be used in a room where temperature is in the range between 15 to 25ºC.
Close enough to connect the mouse and the display.
100 to 120 Vac/200 to 240 Vac parallel bi-polar wall power outlet with the ground line.
Wall outlet to connect the supplied power cord.
Install the server on the floor or rigid, flat desk.
Clean and tidy room
Place having a space enough to fully open the front door (The front door extrudes about 35 mm from the left side of the server when fully opened.)
UPS to prevent momentary voltage drop due to power failure or lightning *
* Optional. UPS is recommended for best use of features of server.

When you have selected a server site, hold the server by its bottom with at least three persons and carry it to the site, then place it slowly and gently.

IMPORTANT: Do not hold the server by its front door to lift the server. The front door may be disengaged and damage the server.

Do not place the server in the following places. Placing the server in such places may cause malfunctions of the server.

- Places with drastic changes in temperature (e.g., near a heater, air conditioner, or refrigerator)
- Places with strong vibration
- Places with corrosive gas in presence, near chemicals, or with possibilities of chemicals sprayed over
- On a non-antistatic carpet
- Places with possibilities of falling objects
- Places where a power outlet that shares the ground line with another (especially the one to which a device with large power consumption is connected) must be used for the server
- Do not install the server near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). (To install the server near equipment that generates power noise, ask your sales agent for separating the power wiring or installing a noise filter.)

CONNECTING PERIPHERAL DEVICES

Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its rear panel. The figure on the next page illustrates available peripheral devices for the server in the standard configuration and locations of the connectors for the devices.

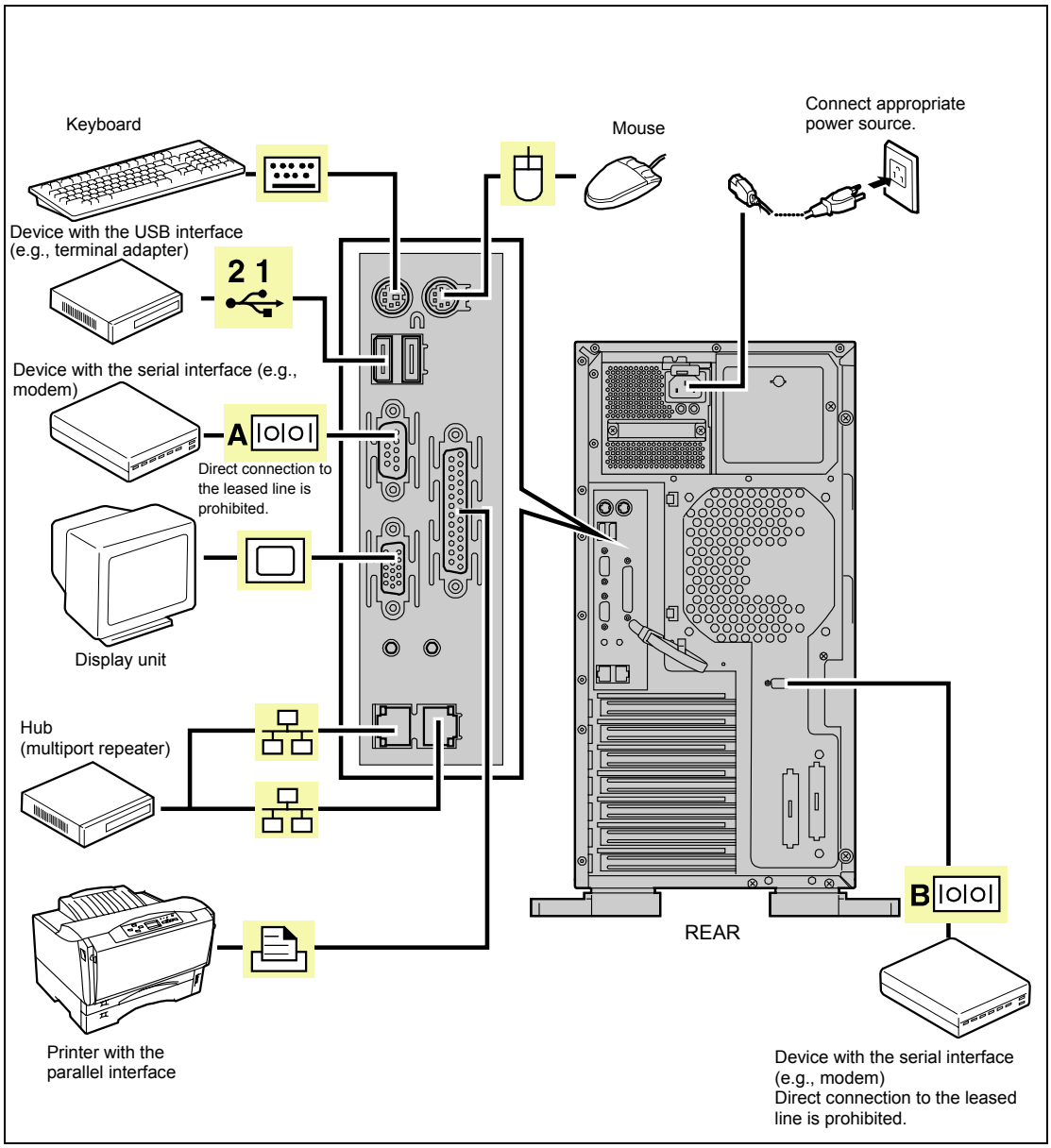
⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not use any damaged cable connector.
- Do not use any unauthorized interface cable.
- Do not use the server with any loose interface connection.
- Do not step on the interface cable or place any heavy object on it.

IMPORTANT:

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
- To connect a third-party peripheral device or interface cable to the server, consult with your sales agent for availability of such a device or cable. Some third-party devices may not be used for the server.
- The total cable length of SCSI device connections is up to 3 m.
- To use the external SCSI port, see Chapter 10 for changing the internal cable connection.
- Make sure that no SCSI IDs for external SCSI devices and internal devices conflict.
- To connect the provided keyboard and mouse, plug their connectors to the server with the "Δ" mark on the connectors facing right.
- A leased line cannot be connected directly to the serial port connectors.


Keyboard
Mouse
Connect appropriate power source.
Device with the USB interface (e.g., terminal adapter)
2 1
Device with the serial interface (e.g., modem)
A
Direct connection to the leased line is prohibited.
Display unit
Hub (multiport repeater)
REAR
B
Printer with the parallel interface
Device with the serial interface (e.g., modem)
Direct connection to the leased line is prohibited.

CONNECTING POWER CORD

Connect the provided power cord to the server.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

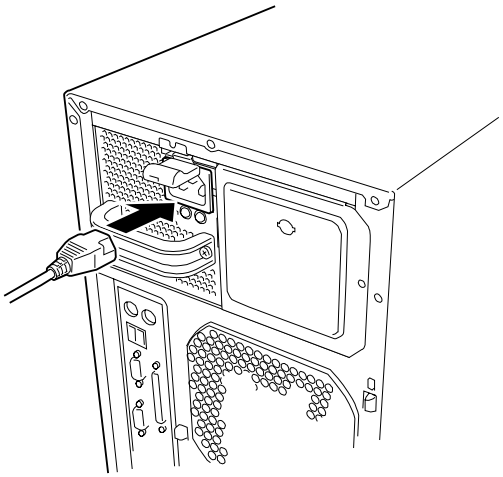
- Do not hold the power plug with a wet hand.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not plug the power cord in to an improper power source.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use the authorized power cord only.

1. Plug the provided power cord into the power receptacle on the rear of the server.
2. Plug the other end of the power cord into the wall outlet.



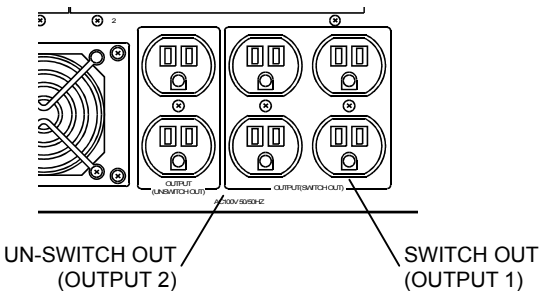
To connect the power cord from the server to an interruptive power supply (UPS), use service outlets on the rear of the UPS.

The UPS service outlets are categorized into two groups: SWITCH OUT and UN-SWITCH OUT. (They may be called "OUTPUT1" and "OUTPUT2".)

To control power supply with an application that controls the UPS, connect the power cord to an SWITCH OUT outlet.

For constant power supply, connect the power cord to a UN-SWITCH OUT outlet. (Connect the modem that is in service for 24 hours to this outlet.)

<Example>



When the power cord from the server to a UPS, change the BIOS setup of the server to link with power supply from the UPS.

To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC-LINK] - [Power On].

Change a parameter for "AC Link" under the Server menu of the BIOS setup utility. See Chapter 4 for details.

TURNING ON THE SERVER

Turn on the server and follow the on-screen instructions for setup.

IMPORTANT: Before turning on the server:

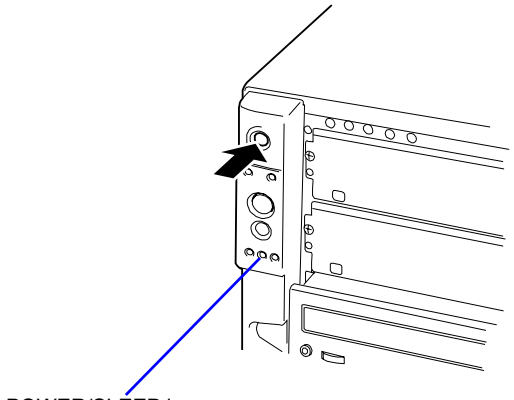
- Some optional boards require setups with the SETUP utility before installation. If the server has a PCI board with the PCI-to-PCI bridge installed, the SETUP utility is enabled to launch. Check on the board specifications to find out whether it requires pre-installation setups before actually installing the board.
- Some installed optional devices or connected peripheral devices require setups before proceeding to the next step.

To use the server with no optional devices installed besides the graphic board, install a desired OS to the server.

1. Make sure that the floppy disk drive contains no floppy disk and the CD-ROM drive contains no bootable CD-ROM.
2. Power on the video display and other external devices.
3. Open the front door and press the POWER switch.

NOTES:

- If the power cord is connected to the power control unit such as the UPS, turn on the power control unit.
- Connect the power cord and wait a few seconds before pressing the POWER switch. The POWER switch does not work in a few seconds after connecting the power cord due to the optional RMC (Remote Management Card) firmware start-up.



The POWER/SLEEP lamp on the front of the server comes on.

In a few seconds, the NEC logo appears on the screen and the Power On Self-Test (POST) begins.

The POST runs automatically when you power on the server or reset it with a keyboard operation (**Ctrl** + **Alt** + **Delete**). The POST runs diagnostics, initializes the server, sets interrupt vectors, detects installed peripheral devices, and boots the operating system (if installed). See Chapter 2 for detailed description on POST.

If the server halts before completing the POST, the POST emits a beep code indicating a fatal system error requiring immediate attention. (See Chapter 8, "Troubleshooting," for troubleshooting information.)

During memory test, the POST displays the amount of memory it was able to access and test. Depending on the amount of installed memory, it may take several minutes to complete the memory test.

NOTE: The factory-set is defined to hide the POST screen with the NEC logo screen. You can always change the NEC logo screen to the POST screen by pressing **Esc**. To change the start-up screen, use the BIOS setup utility, "SETUP." (See Chapter 4 for details.)

During the POST, you will see the banner message to prompt you to launch the BIOS SETUP utility stored in ROM on system board or on an installed option board.

Start the BIOS SETUP utility appropriate to your system environment to change the BIOS setup. For the BIOS SETUP for the server, see Chapter 4. For the BIOS SETUP for the option board, refer to the manual that comes with the option board.

IMPORTANT: Always allow POST to complete before turning off your system.

INSTALLING OPERATING SYSTEM

See Chapter 5 for installing the Microsoft Windows Server 2003 operating system or Microsoft Windows 2000 operating system.

To install the other operating system listed above, contact your sales agent.

IMPORTANT: Use NEC EXPRESSBUILDER for initial setup of your server. The NEC EXPRESSBUILDER is a support software for the server. It simplifies the process of installing and configuring your server. See Chapter 6 for details on NEC EXPRESSBUILDER.

INSTALLING UTILITIES

Install the utilities that come with the server. See Chapter 6 for details.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Set the NEC EXPRESSBUILDER CD-ROM in the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Set a floppy disk in the floppy disk drive.
6. Select [Save].

Chapter 4

Configuring Your Server

Configuration and setup utilities are used to change your system configuration. You can configure your system, as well as option boards you may add to your system, using the BIOS Setup Utility. Several unique system parameters are configured using the BIOS Setup, which is stored in the system FLASH memory.

The Adaptec Configuration Utility detects the SCSI host adapters on the system board. Use this utility if you need to configure the two SCSI controllers in your system, to configure the hard disk drives connected to a SCSI controller as a RAID drive, or to perform a SCSI disk format or verify disk operation on the SCSI disk drives. The Adaptec Configuration Utility is also used to configure any SCSI removable media devices installed in your system.

If your system has been factory configured, the BIOS Setup or Adaptec Configuration Utility do not need to be run unless you want to change the password or security features, add certain types of option boards or devices, or upgrade your system board.

This chapter also provides information on several system configuration parameters that are set by jumpers on the system board. However, these parameters do not usually require change.

SYSTEM BIOS (SETUP)

The SETUP utility is used to change system configuration parameters. This utility is pre-installed in the flash memory of the server and ready to run.

The server is configured with the correct parameters using the SETUP utility and shipped in the best conditions. Thus, you don't need to use the SETUP utility in most cases. However, you might wish to use the SETUP utility in the cases described below.

IMPORTANT:

- The SETUP utility is intended for system administrator use only.
- The SETUP utility allows you to set a password. The server is provided with two levels of password: Supervisor and User. With the Supervisor password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.
- Do not set any password before installing the OS.
- The server contains the latest version of the SETUP utility. Dialog boxes appear on your SETUP utility, thus, may differ from descriptions in this manual. If you find anything unclear, see the online help or ask your sales agent.
- Use the Exit menu when exiting the SETUP utility. Exiting the utility with the POWER switch or reset operation causes the stored parameters to lose.

Starting SETUP Utility

Powering on the server starts POST (Power On Self-Test) and displays its check results. If the NEC logo is displayed, press **Esc**.

After a few seconds, the following message appears at bottom left on the screen.

```
Press <F2> to enter SETUP
```

Press **F2** to start the SETUP utility and display its Main menu.

If you have previously set a password with the SETUP utility, the password entry screen appears. Enter the password.

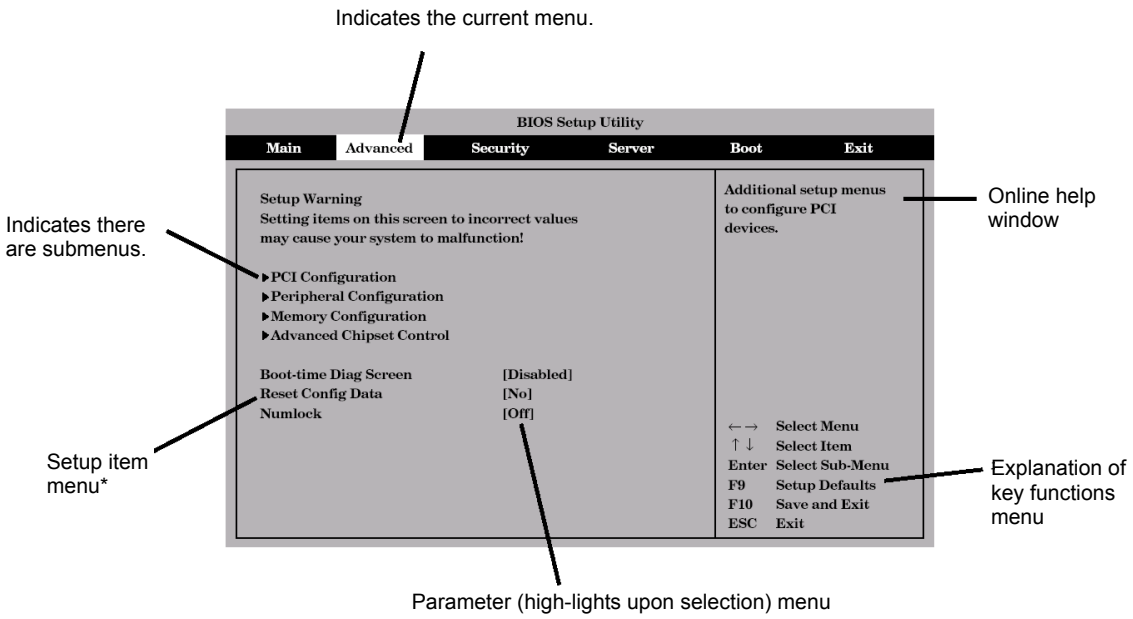
```
Enter password:[                ]
```

Up to three password entries will be accepted. If you fail to enter the password correctly for three consecutive times, the server halts. (You can no longer proceed.) Power off the server.

NOTE: The server is provided with two levels of password: Administrator and User. With the Administrator password, you can view and change all system parameters. With the User password, system parameters available for viewing and changing are limited.

Description on On-Screen Items and Key Usage

Use the following keyboard keys to work with the SETUP utility. (Key functions are also listed at the bottom of the screen.)



* The menus displayed in gray indicates the information only or unchangeable secured by BIOS password.

Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, Server, Boot, or Exit menu.
– and **+**:	Changes the value (parameter) of the selected item. When a submenu option (an option preceded by "➤") is selected, these keys are disabled.
Enter	Press **Enter** to select (determine) parameters.
Esc	Exit SETUp and return to the previous screen.
F9:	Sets the parameter of the currently displayed item back to the factory set parameter.
F10:	Save and exit the SETUP utility.

Menu and Parameter Descriptions

The SETUP utility has the following six major menus:

- Main
- Advanced
- Security
- Server
- Boot
- Exit

To set minute functions, select a submenu from the above menus. The following describes available functions and parameters, as well as the factory-set, for each menu.

Main

Option	Parameter	Description	Your Setting
System Time	HH:MM:SS	Set the system time.	
System Date	MM/DD/YYYY	Set the system date.	
Legacy Floppy A	Disabled 360Kb 5 1/4 1.2MB 5 1/4 720Kb 3 1/2 [1.44/1.25MB 3 1/2] 2.88MB 3 1/2	Set the settings of floppy disk drive A (standard configuration).	
Legacy Floppy B	[Disabled] 360Kb 5 1/4 1.2MB 5 1/4 720Kb 3 1/2 1.44/1.25MB 3 1/2 2.88MB 3 1/2	Set the settings of floppy disk drive B. No second floppy disk drive is included in this system.	
Hard Disk Pre-Delay	[Disabled] 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds	Allows slower spin-up drives to come ready.	
Primary IDE Master/ Primary IDE Slave Secondary IDE Master Secondary IDE Slave Serial ATA Channel 0 Master Serial ATA Channel 1 Master	Select submenu	Set the information on the device connected to each channel on the submenu. The settings of some items may be changed. However, leave the items as they are at the shipment.	
Processor Settings	Select submenu	Shows the processor settings submenu.	
Language	[English (US)] Italiano Español Français Deutsch	Select which language BIOS displays.	

[ ]: Factory-set

Primary IDE Master/Primary IDE Slave/Secondary IDE Master/Secondary IDE Slave/Serial ATA Channel 0 Master/ Serial ATA Channel 1 Master

Correspondence between the menu items and devices:

- Primary IDE Master: ATA hard disk drive 1 (option)
- Primary IDE Slave: ATA hard disk drive 2 (option)
- Secondary IDE Master: CD-ROM drive (standard)
- Secondary IDE Slave: None
- Serial ATA Channel 0 Master: Serial ATA hard disk drive 1 (option)
- Serial ATA Channel 1 Master: Serial ATA hard disk drive 2 (option)

Option	Parameter	Description	Your Setting
Type	None User [Auto] CD-ROM	Selects the type of device attached to the IDE or serial ATA channel. It is strongly recommended to keep the factory setting [Auto].	
The following options do not appear when *None* or *Auto* are selected for Type.			
Multi-Sector Transfers	Disabled 2 Sectors 4 Sectors 8 Sectors 16 Sectors	Specifies the number of sectors that are transferred per block during multiple sector transfers.	
LBA Mode Control	Enabled Disabled	Enable/disable LBA instead of cylinder, head, sector, addressing.	
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3/DMA1 FPIO 4/DMA2	Select the method for moving data to/from the drive.	
Ultra DMA	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Select the Ultra DMA mode used for moving data to/from the drive.	

[ ]: Factory-set

Processor Settings

Option	Parameter	Description	Your Setting
Processor Retest	[No] Yes	If yes, BIOS will clear historical processor status and retest the processor on the next boot.	
Processor Speed	nnn GHz	Displays clock speed for the processor. (View only)	
Processor 1 CPUID	Numeral Disabled	Displays CPU ID for processor, if present. "Disabled" indicates that the processor is defected. (View only)	
Processor 1 L2 Cache	nnn KB	Displays L2 cache size for processor.	
Processor 2 CPUID	Numeral Disabled	Displays CPU ID for processor, if present. "Disabled" indicates that the processor is defected. (View only)	
Processor 2 L2 Cache	nnn KB	Displays L2 cache size for processor.	
Hyper-Threading Technology	[Enabled] Disabled	Disable or enable the Hyper-Threading Technology.	

[ ]: Factory-set

Advanced

Option	Parameter	Description	Your Setting
Memory Configuration	–	Displays Memory Configuration submenu.	
PCI Configuration	–	Displays PCI Configuration submenu.	
Peripheral Configuration	–	Displays Peripheral Configuration submenu.	
Advanced Chipset Control	–	Displays Advanced Chipset Control submenu.	
Boot-time Diagnostic Screen	[Enabled] Disabled	If enabled, the BIOS will display the NEC logo during POST. Press **Esc** to switch to the POST execution screen.	
Reset Configuration Data	[No] Yes	Select "Yes" if you want to clear the system configuration data during the next boot. Automatically reset to "No" in the next boot.	
NumLock	[Auto] Off On	Sets power on Numlock state.	
Memory/Processor Error	[Boot] Halt	If "Halt" is selected, the boot is stopped when POST error occurs.	

[ ]: Factory-set

Memory Configuration

Option	Parameter	Description	Your Setting
System Memory	nnn KB	Indicates the total capacity of the basic memory. (View only)	
Extended Memory	nnnnnnn KB	Indicates the total capacity of the extended memory. (View only)	
DIMM Group #1 - #4 Status	Normal Not installed Disabled	Displays the current status of the memory group. Disabled indicates that a DIMM in the bank has failed and the entire group has been disabled.	
Memory Retest	[No] Yes	Causes BIOS to retest all memory on the next boot.	
Extended RAM Step	1MB 1KB Every location [Disabled]	"1MB" indicates that the memory test is done in the unit of 1MB. "1KB" indicates that the memory test is done in the unit of 1KB. "Every location" tests every memory location. "Disabled" indicates that only memory initialization is done.	
Online Spare Memory	[Disabled] Enabled	Disables or enables online spare memory feature. See "DIMM" in Chapter 8 for details.	

[ ]: Factory-set

PCI Configuration

– Embedded SCSI submenu

Option	Parameter	Description	Your Setting
SCSI Controller	[Enabled] Disabled	Enables or disables the onboard SCSI controllers.	
Option ROM Scan	[Enabled] Disabled	If Enabled, initialize device expansion ROM.	

[ ]: Factory-set

– Embedded NIC (Dual Gbit) submenu

Option	Parameter	Description	Your Setting
LAN Controller	Disabled [Enabled]	If Disabled, the BIOS will hold the embedded chip in reset. In this configuration, the controller hardware is completely disabled, and will be invisible to the PnP operating systems.	
Option ROM Scan	[Enabled] Disabled	If Enabled, initialize device expansion ROM.	

[ ]: Factory-set

– Embedded Video Controller submenu

Option	Parameter	Description	Your Setting
Onboard VGA Control	Disabled [Enabled]	If Disabled, the BIOS will hold the embedded chip in reset. In this configuration, the controller hardware is completely disabled, and will be invisible to the PnP operating systems.	

[ ]: Factory-set

Option	Parameter	Description	Your Setting
PCI Slot 1 Option ROM – PCI Slot 6 Option ROM	[Enabled] Disabled	Enable option ROM scan of the selected device. When the graphics accelerator board is installed or the disk array controller or SCSI controller boards to be installed are connected to the hard disk in which OS is installed, set this item to "Enabled." When the LAN controller board with installation of the option ROM BIOS is used but the board does not provide network booting, set this item to "Disabled."	

[ ]: Factory-set

Peripheral Configuration

IMPORTANT: Note that the interrupt and/or base I/O address are not overlapped with others. If the value set for the interrupt or base I/O address is used in another resource, the yellow asterisk (*) appears. Reset any item with the yellow asterisk properly.

Option	Parameter	Description	Your Setting
Serial Port A	Disabled [Enabled] Auto	Selects whether serial port A is enabled or disabled.	
Base I/O address	[3F8] 2F8 3E8 2E8	Selects the base I/O address for serial port A.	
Interrupt	IRQ 3 [IRQ 4]	Selects the interrupt for a serial port A.	
Serial Port B	Disabled [Enabled] Auto	Selects whether serial port B is enabled or disabled (display only).	
Base I/O address	3F8 [2F8] 3E8 2E8	Selects the base I/O address for serial port A.	
Interrupt	[IRQ 3] IRQ 4	Selects the interrupt for a serial port A.	
Parallel Port	Disabled [Enabled] Auto	Selects whether the parallel port is enabled or disabled.	
Base I/O address	[378] 278	Selects base I/O address for a parallel port.	
Interrupt	IRQ 5 [IRQ 7]	Selects interrupt for a parallel port.	
Mode	Output only Bi-directional EPP [ECP]	Selects the operation mode of the parallel port.	
DMA channel	[DMA1] DMA3	Selects DMa chanel for a parallel port.	
PS/2 Mouse	Disabled [Enabled] Auto Detect	If disabled, PS/2 mouse port will not function.	
USB Host Controller	Disabled [Enabled]	If disabled, the USB ports do not accept the USB device class 3 (HID: Human Interface Device).	
Legacy USB Support	Disabled [Enabled]	Selects whether the USB keyboard is made available in OS which does not support USB formally.	

Option	Parameter	Description	Your Setting
Parallel ATA	Disabled Channel 0 Channel 1 [Enabled]	Selects parallel ATA is enabled or disabled.	
Serial ATA	Disabled [Enabled]	Selects whether the serial ATA is enabled or disabled.	

[ ]: Factory-set

Advanced Chipset Control

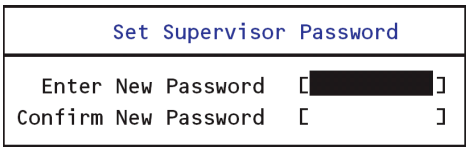
Option	Parameter	Description	Your Setting
Enable Multimedia Timer	[No] Yes	Specify whether the system supports the multimedia timer feature.	
Wake On LAN/PME	Disabled [Enabled]	Specify whether the remote power-on function through embedded NIC, PCI devices in slots 1 to 5 is enabled or disabled.	
Wake On Ring	[Disabled] Enabled	Specify whether the remote power-on function through a serial port is enabled or disabled.	
Wake On RTC Alarm	[Disabled] Enabled	Specify whether the remote power-on function by using RTC alarm feature is enabled or disabled.	

[ ]: Factory-set

Security

The Security menu appears if you move the cursor to the position of "Security."

Press **Enter** on "Set Supervisor Password" or "Set User Password," to display the following screen.



Enter the passwords on the dialog box. Passwords may have up to eight characters including alphanumerics and symbols.

IMPORTANT:

- User password can be set only when Administrator password is already set.
- Set the passwords only after OS is installed.

See the table below for the items.

Option	Parameter	Description	Your Setting
User Password is	Clear Set	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
Supervisor Password is	Clear Set	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
Set User Password	Up to eight alphanumerics	Supervisor password controls access to the setup utility. When **Enter** is pressed, the user is prompted for a password; press **Esc** to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter).	

Option	Parameter	Description	Your Setting
Set Supervisor Password	Up to eight alphanumerics	When the <Enter> key is pressed, the user is prompted for a password; press ESC key to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter).	
Password on boot	[Disabled] Enabled	Disables or enables password entry on boot.	
Fixed disk boot sector	[Normal] Write Protect	Will write protect the boot sector of the hard drive to prevent viruses from corrupting the drive under DOS if set to write protect.	
Secure Mode Timer	[Disabled] 1 min 2 min 5 min 10 min 20 min 1 hr. 2 hr.	Set the period from no input from the keyboard or mouse to the point at which the system enters into the secure mode.	
Security Hot Key CTRL-ALT-	[L] Z	Specify the hot key to invoke secure mode features. Pressing the assigned key along with **Ctrl** and **Alt** invoke secure mode. This option is enabled when User Password is set.	
Secure Mode Boot	[Disabled] Enabled	Specify whether the system boots in secure mode. This option is enabled when User Password is set.	
Video Blanking	[Disabled] Enabled	Specify whether to turn off the monitor when secure mode is activated.	
Floppy Write Protect	[Disabled] Enabled	Controls access to the floppy disk drive during the secure mode.	
Power Switch Inhibit	[Disabled] Enabled	Enables or disables the POWER switch. If "Enabled" is selected, power-off with the POWER switch becomes unavailable after OS boot-up. (Forced shut down also becomes unavailable. Forced shut down is a feature to shut down by pressing the POWER switch for at least four seconds.)	

[ ]: Factory-set

Server

Option	Parameter	Description	Your Setting
System Management	–	System Management submenu is displayed.	
Console Redirection	–	Console Redirection submenu is displayed.	
Assert NMI on PERR	Disabled [Enabled]	Indicates whether PCI PERR is supported or not.	
Assert NMI on SERR	Disabled [Enabled]	Indicates whether PCI SERR is supported or not.	
Post Error Pause	Disabled [Enabled]	Indicates whether POST is aborted once at the end of POST if an error occurs during the execution of POST.	
AC LINK	Stay Off [Last State] Power On	Indicates the AC LINK function. Shows the state of the power of the server.	

[ ]: Factory-set

IMPORTANT: To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC Link] - [Power On].

The table below shows the operation when the AC power to the server is turn off once and then on again, depending on the setting of "AC LINK."

System status before AC power off	Setting of AC LINK		
	Stay Off	Last State	Power On
Operating	Off	On	On
Aborting (DC power being off also)	Off	Off	On
Forced shutdown	Off	Off	On

* Press the power switch continuously for four seconds or longer. This forcibly turns off the power.

System Management Submenu

Option	Parameter	Description	Your Setting
BIOS Version	-	Displays the current BIOS version. (View only)	
Board Part Number	-	Displays the mother board part number. (View only)	
Board Serial Number	-	Displays the mother board serial number. (View only)	
System Part Number	-	Displays the system part number. (View only)	
System Serial Number	-	Displays the System serial number. (View only)	
Chassis Part Number	-	Displays the chassis part number. (View only)	
Chassis Serial Number	-	Displays the chassis serial number. (View only)	
IPMI Specification Version *	-	Displays IPMI specification version. (View only)	
BMC Device ID *	-	Displays BMC device ID. (View only)	
BMC Device Version *	-	Displays BMC device version. (View only)	
BMC Firmware Version *	-	Displays BMC firmware version. (View only)	
PIA Version *	-	Displays version of the platform information area. (View only)	
SDR Revision *	-	Displays revision of the sensor data record.	

[ ]: Factory-set

* Displayed only when an optional remote management card is installed in your system.

Console Redirection Submenu

Option	Parameter	Description	Your Setting
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the address/interrupt of the serial port to which a remote console is connected.	
ACPI Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the serial port to which an ACPI console is connected.	
Baud Rate	9600 [19.2K] 38.4K 57.6K 115.2K	Specify the baud rate used for the interface with successive remote consoles.	
Flow Control	None Xon/Xoff [CTS/RTS] CTS/RTS+CD	Specify the flow control method.	
Console Type	[PC ANSI] VT100+ VT-UTF8	Specify the type of remote console.	

[ ]: Factory-set

Boot

If you move the cursor to the position of "Boot," the Boot menu appears, which is used to set the boot priority.

The factory-default boot order is listed below.

1. CD-ROM drive
2. Removable Devices
3. Hard Drive
4. IBA GE Slot 0910 v1216
5. IBA GE Slot 0910 v1216

The server searches for devices in the order set in this menu on booting. Finding the boot software, the server starts the software.

The priority of the boot devices can be changed by using the ↑, ↓, **+**, and **-** keys. Move the cursor to the desired device with the ↑ or ↓ key and change the priority with the **+** or **-** key.

> **IMPORTANT:** To boot NEC EXPRESSBUILDER, set the priority of the devices as shown in the figure above.

Exit

The options on the menu are described below.

Exit Saving Changes

Exit after writing all modified BIOS Setup item values to CMOS.

Exit Discarding Changes

Exit leaving CMOS unmodified. User is prompted if any of the setup fields ware modified.

Load Setup Defaults

Load default values for all BIOS Setup items.

> **IMPORTANT:** This option sets [SATA RAID Enabled] in the [Advanced] menu to [Disable]. If the SATA hard disk drives are installed in your server and the onboard SATA RAID feature is used, change the parameter of the [SATA RAID Enabled] from [Disable] to [Enable] before exiting BIOS Setup.

Discard Changes

Read the previous values of the all BIOS Setup items from CMOS.

Save Changes

Write all BIOS Setup item values to CMOS.

SCSI BIOS (SCSI*Select*)

The SCSI*Select* utility is provided to configure the SCSI controller on the mother board (or the SCSI controller on an optional board). This utility may be started with a simple key operation while POST is in progress and requires no specific start-up disk.

Using SCSI*Select* Utility

Use the SCSI*Select* utility mainly to set the transfer speed of connected SCSI devices or to configure the internal hard disk drives connected to the onboard SCSI controller as a RAID drive (HostRAID). The SCSI devices include those installed in the backup file bay, such as an external DAT and MO, but not hard disks.

> **IMPORTANT:** SCSI configuration must be made on a per-SCSI controller basis with a utility. The server contains one SCSI controller. When you added optional SCSI controllers, you need to make configuration for each SCSI controller in addition to the standard internal SCSI controller. Some additional SCSI controllers may require a different utility to make changes to the configuration.

Configuring SCSI Controller on Mother Board

The following describes configuration for the SCSI controller on the mother board of the server.

Running the Utility

To run the utility, perform the following procedures:

1. Power on the Express server.

   The following message appears while POST is in progress.

   IMPORTANT: The message appears for each additional SCSI controller.

   ```
   Adaptec SCSI BIOS Vxxx xxxxx
   (c) 2000 Adaptec, Inc. All Rights Reserved

   ◀ ◀ ◀ Press <Ctrl> <A> for SCSISelect(TM) Utility! ▶ ▶ ▶
   ```

2. Press and hold **Ctrl** and **A**.

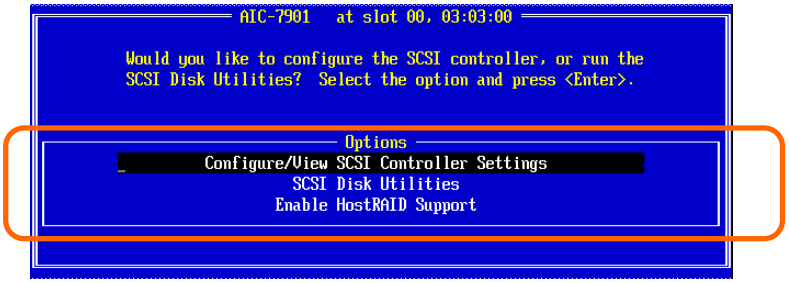
   The SCSI*Select* utility starts and its Main menu appears.

3. Select the channel and press **Enter**.

   NOTE: "AIC-7902A" is for internal SCSI hard disk drives. "AIC-7902B" is for backup file devices.

   The Options menu appears.

4. Select "Option" and press **Enter**.

   
   AIC-7901 at slot 00, 03:03:00
   Would you like to configure the SCSI controller, or run the
   SCSI Disk Utilities? Select the option and press <Enter>.
   Options
   Configure/View SCSI Controller Settings
   SCSI Disk Utilities
   Enable HostRAID Support

   If you wish to configure the adapter or a device, select "Configure/View SCSI Controller Settings".

   If you wish to format a disk, verify disk media, or display a list of devices and their SCSI IDs, select "SCSI Disk Utilities".

   IMPORTANT: This system does not support "Enable HostRAID Support". Do not change factory-set default. If changed, the system will fail to start.

Exiting the Utility

To exit the utility, press Esc until a message prompts you to exit (if you changed any setting, you are prompted to save the changes before you exit).

Configure/View SCSI Controller Settings

The Configure/View Host Adapter Settings has the following menu items and parameters. Read descriptions to select a correct parameter for each menu item.

SCSI Bus Interface Definitions

To set three menu items under "SCSI Bus Interface Definitions", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection. The following table lists menu items, available parameters, and descriptions.

Menu item	Parameter	Description
SCSI Controller ID	0 - [7] - 15	Select "7".
SCSI Controller Parity	[Enabled] Disabled	Select "Enabled".
SCSI Controller Termination	[Enabled] Disabled	Enable or disable the SCSI termination. Select "Enabled".

[ ]: Factory-set

Additional Options

To set three menu items under "Additional Options", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to display its submenu. Then, select a submenu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection.

- **Boot Device Configuration**

  Move the cursor onto "Boot Device Configuration" and press **Enter** to display the submenu. The Boot Device Configuration submenu allows you to select the device connected to the channel A or B as a boot device. Always select "AIC-7902 A".

■ SCSI Device Configuration

Move the cursor onto "SCSI Device Configuration" and press **Enter** to display the submenu.

The following table lists submenu items, available parameters, and descriptions.

IMPORTANT: Select a parameter for each submenu item on a per-SCSI ID basis. Verify the SCSI ID of a desired device before configuration.

NOTE: To find out the SCSI ID for the optional device connected, select "SCSI Disk Utilities" on the Options menu and press **Enter**. See "SCSI Disk Utilities" for detail.

Submenu item	Parameter	Description
Sync Transfer Rate (MB/Sec)	[320] 33.3 160 20.0 80.0 10.4 66.6 ASYN 40.0	Select "320". You may need to change the value depending on your optional device. Refer to the manual that comes with your optional device for details.
Packetized	[Yes] No	Optimizes bus utilization and minimizes command overhead to bolster performance by transferring commands, data, and status using Deal Transition (DT) data phases.
QAS	[Yes] No	Quick Arbitration and Selection (QAS) reduces the overhead of control release on the SCSI bus from one device to another to help decrease command overhead and increase bus utilization.
Initiate Wide Negotiation	[Yes] No	Select "Yes" if your SCSI device supports the Wide SCSI interface. Select "No" if not.
Enable Disconnection	[Yes] No	Select "Yes".
Send Start Unit Command	[Yes] No	Select "Yes" to send the command to the hard disk. Otherwise select "No".
BIOS Multiple LUN Support	Yes [No]	Select "No".
Include in BIOS Scan	[Yes] No	Select "Yes".

[ ]: Factory-set

■ Advanced Configuration

Move the cursor onto "Advanced Configuration" and press **Enter** to display the submenu.

The following table lists submenu items, available parameter, and descriptions.

Submenu item	Parameter	Description
Reset SCSI Bus at IC Initialization	[Enabled] Disabled	Select "Enabled".
Display <Ctrl><A> Message During BIOS Initialization	[Enabled] Disabled	Select "Enabled".
Extended Int 13 Translation for DOS Drives > 1 GByte	[Enabled] Disabled	Select "Enabled".
POST Display Mode	[Verbose] Silent Diagnostic	Select "Verbose".
SCSI Controller Int 13 Support	[Enabled] Disabled: NOT Scan Disabled: scan bus	Enable or disable SCSI BIOS. Select "Enabled" for most cases other than the following: • To boot the OS from a hard disk connected to any other controller than SCSI controller. (If the controller has no hard disks connected, there is no problem.) • BIOS of the SCSI controller may be disabled to reserve an area in the expansion ROM space if the controller has no hard disks connected.
Domain Validation	[Enabled] Disabled	Select "Enabled".
Support Removable Disks Under Int 13 as Fixed Disks	Boot Only All Disks [Disabled]	AIC-79xx BIOS automatically controls the removable disks.
BIOS Support for Bootable CD-ROM	[Enabled] Disabled	Select "Enabled".

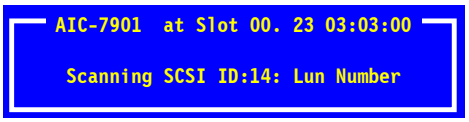
[ ]: Factory-set

SCSI Disk Utilities

This utility scans the SCSI bus for SCSI devices, reports a description of each device. Run these utilities before configuring SCSI devices.

To enter the utility, select "SCSI Disk Utilities" on the Options menu.

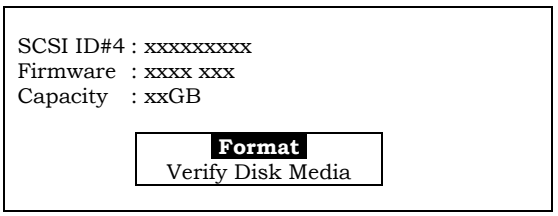
The SCSI ID scan begins displaying the message as shown below.



When the SCSI ID scan completes, the screen listing SCSI IDs and associated devices appears.

Find out the SCSI ID for the installed optional on this screen. You can also view the device information by selecting a device and pressing **Enter**.

The following sub menu appears.



The following table lists submenu items and descriptions.

Submenu item	Description
Format	Formats the selected device in the raw level.
Verify Disk Media	Verifies all the sectors in the selected device. If one or more bad sectors are found, reassigns the sectors.

HostRAID

Move the cursor onto "HostRAID" and press **Enter** to choose the HostRAID option.

Submenu item	Parameter	Description
HostRAID	Enabled [Disabled]	Select "Disabled" if the onboard HostRAID controller is not used.

[ ]: Factory-set

NOTE: For detail explanation on the HostRAID feature, see SCSI*Select* Utility User's Manual and Adaptec Storage Manager™ - Browser Edition User's Guide. You may view or print the SCSI*Select* Utility User's Manual and Adaptec Storage Manager™ - Browser Edition User's Guide from the NEC EXPRESSBUILDER CD-ROM.

Configuring SCSI Controller on Optional Board

To configure SCSI devices connected to an optional SCSI controller board, use the SCSI BIOS utility provided with the optional SCSI controller board.

Refer to the manual that comes with the optional SCSI controller board for details.

When the server has multiple SCSI controller boards installed, the server first displays the start-up message of the SCSI*Select* utility for the SCSI controller on the mother board. It then displays the utility start-up message for additional SCSI controllers one by one. The start-up message appears for the SCSI controller board in the onboard SCSI first, the PCI #1, #2, #3, #4, #5, and finally #6. The message displayed may vary depending on the optional SCSI controller board. Refer to the manual that comes with the optional SCSI controller board for details.

RAID BIOS

The RAID (Redundant Array of Inexpensive Devices) option available for your system is N8103-80F/81F/86F RAID controller boards which give your system the added security of fault tolerance.

If you want to change the RAID level or add additional hard disks to the array, use the RAID configuration utility. The RAID configuration utility is included with a RAID controller.

If you are adding the RAID controller to an existing system, the RAID configuration utility allows you to configure your disk array before reinstalling your network operating system. The RAID controllers support various versions of RAID technology (referred to as RAID levels). To use any RAID level, you must configure the RAID controller using the RAID configuration utility prior to installing your Network Operating System. For an explanation of this utility, refer to the documentation that comes with the RAID controller. It describes RAID technology and provides tips on making your array perform well in your specific application. It also covers array hardware preparation, configuration, and initialization. After completing the steps in the manual, you can install your Network Operating System.

If you want to remotely configure the array (from a PC client); increase array capacity online; or monitor statistics on disk and controller activity, you must install the array manager provided with your RAID subsystem. Increasing array capacity is covered in the documentation shipped with the option.

CONFIGURING MOTHER BOARD JUMPERS

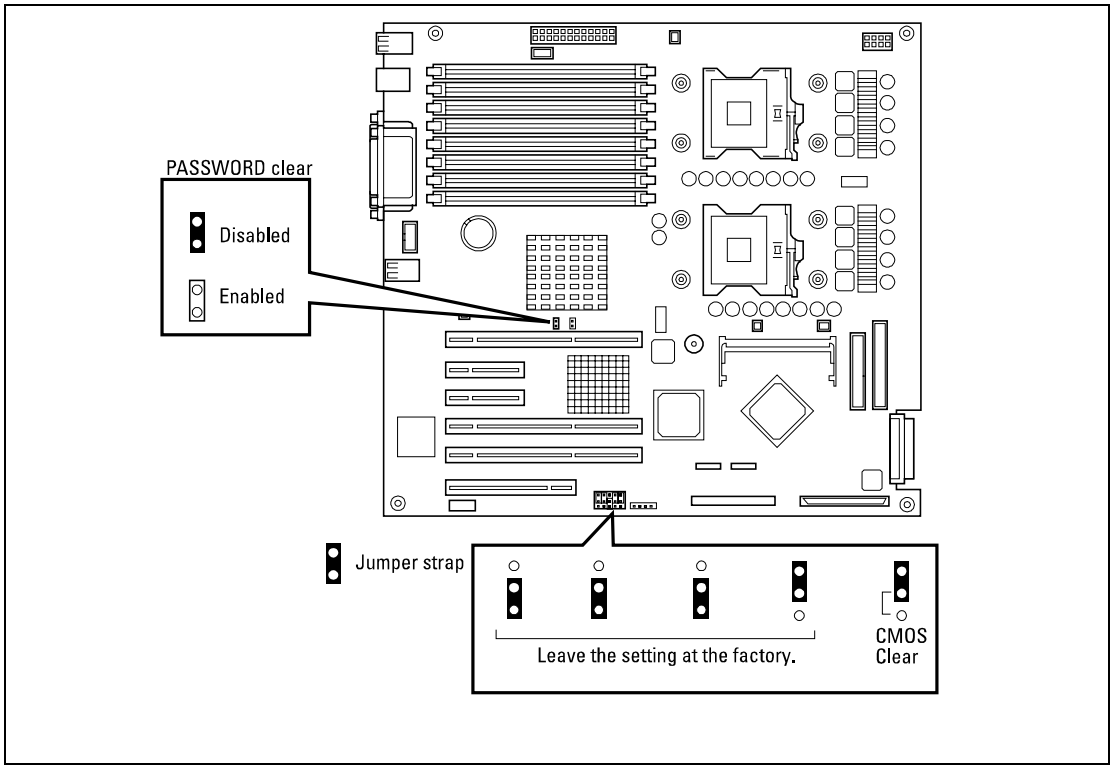
With the pre-installed SETUP utility, you can set desired passwords to protect the data stored in the server against access from unauthorized users. When you forget the passwords, however, you may want clear them. The following describes how to clear these passwords. You can also use the following procedure to clear the CMOS data in the server.

IMPORTANT:

- Clearing the CMOS data resumes the factory-set configuration data.
- After clearing CMOS, you must run the BIOS SETUP utility and execute the following menus to reconfigure your mother board.
  – Load Setup Defaults in the Exit menu
  – Memory Retest of Memory Configuration in the Advanced menu
  – Processor Retest of Processor Settings in the Main menu

To clear passwords or the CMOS data, use the jumper switch on the mother board of the server. The following figure illustrates the jumper switch location.

IMPORTANT: Do not change any other switch settings. Any change may cause the server to fail or malfunction.



The following describe the clearing procedure.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Never attempt to lift the server only by yourself.
- Make sure to complete board installation.
- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. See the section "Preparing for Installation and Removal" as described in Chapter 9 of this guide to prepare.
2. Remove the side cover.
3. Locate the position of the jumpers on the mother board you are changing.
4. For clearing the BIOS password, remove the jumper strap on the BIOS password clear jumper. For Clearing the CMOS, move the jumper strap to the CMOS clear position.

   Refer to the previous illustration to find the location of the jumper.
5. Wait for a while (about 5 seconds), and then reinstall the jumper block to the default position.
6. Reinstall the server removed in Step 2.
7. Plug the power cord to your server and turn on the server.
8. Press **F2** at the prompt to run the BIOS SETUP utility, and select "Load Setup Defaults" at the Exit menu.

Chapter 5

Installing the Operating System with Express Setup

This section describes information on using Express Setup to install and configure the following operating systems to the server.

- Microsoft® Windows Server™ 2003 Standard Edition / Microsoft® Windows Server™ 2003 Enterprise Edition
- Microsoft® Windows® 2000 Server / Microsoft® Windows® 2000 Advanced Server

To use the server with the other operating systems described in this section, contact your service representative.

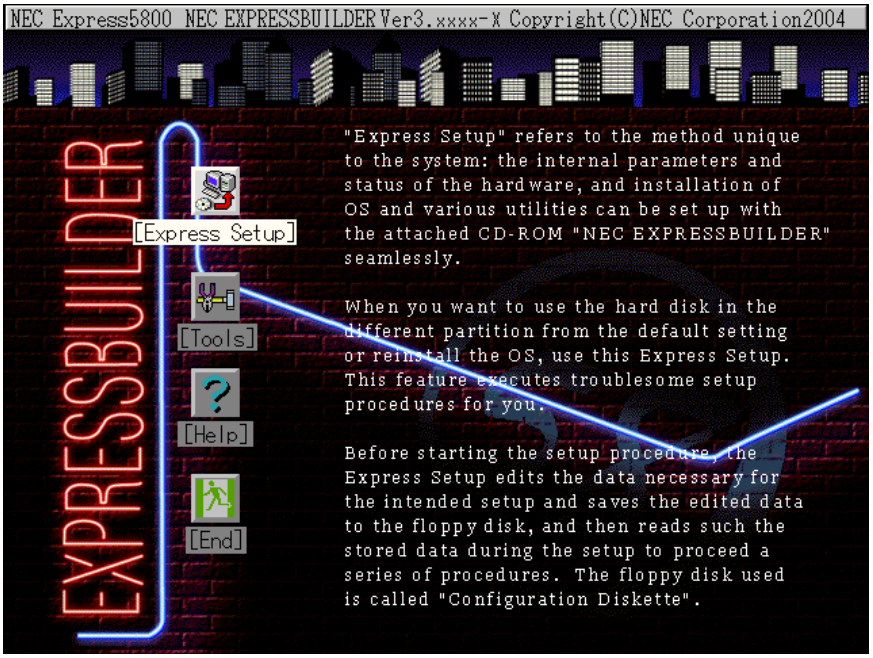
> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See Chapter 4 for detail.

This chapter also includes information on configuring the HostRAID™ drive used with the onboard serial ATA interface. Refer to the end of this chapter for detail.

About Express Setup

"Express Setup" contained in your NEC EXPRESSBUILDER CD-ROM is intended for initial setup of the server. Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen prompts for software selection and configuration. The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

IMPORTANT: Express Setup is intended for the initial setup of the server system. Therefore, it clears the contents of the hard disk.


NEC Express5800 NEC EXPRESSBUILDER Ver3.xxxx-x Copyright(C)NEC Corporation2004
EXPRESSBUILDER
[Express Setup]
[Tools]
[Help]
[End]
"Express Setup" refers to the method unique to the system: the internal parameters and status of the hardware, and installation of OS and various utilities can be set up with the attached CD-ROM "NEC EXPRESSBUILDER" seamlessly.
When you want to use the hard disk in the different partition from the default setting or reinstall the OS, use this Express Setup. This feature executes troublesome setup procedures for you.
Before starting the setup procedure, the Express Setup edits the data necessary for the intended setup and saves the edited data to the floppy disk, and then reads such the stored data during the setup to proceed a series of procedures. The floppy disk used is called "Configuration Diskette".

For Microsoft Windows Server 2003 and Windows 2000, Express Setup automatically configures your server and installs the operating system. After a few tasks are completed, all that remains to be done is to remove the NEC EXPRESSBUILDER CD-ROM and set the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

For the other operating systems, Express Setup initializes the target disk(s), creates the maintenance partition, and installs the various maintenance utilities from the NEC EXPRESSBUILDER CD-ROM to lead your server to ready-to-install for the desired operating system.

Express Setup uses "Configuration Diskette". The Configuration Diskette is a floppy disk that includes the configuration information for the server setup used in the automatic installation mode. Express Setup will perform all the process of the setup using the information in the floppy disk. During this procedure, you do not have to be in front of the Express server to confirm the state of the setup. Also, using the same Configuration Diskette used before allows you to re-setup your server with the same condition as before.

Express Setup includes two types of installation method.

- Quick start

  Quick start uses the Configuration Diskette that the configuration parameters for server setup are pre-loaded before starting the Express Setup. The configuration parameters are loaded by using the Configuration Diskette Creator (see Chapter 6).

- Normal start

  Normal start is to create the Configuration Diskette after starting the Express Setup.

NOTES:

- Use the blank disk in the accessory box to create Configuration Diskette.
- You can create Configuration Diskette in advance using "Configuration Diskette Creator" included in NEC EXPRESSBUILDER.
- If you create Configuration Diskette in advance, you can abbreviate the items that is necessary to input or select during Express Setup. (You can also create or modify the setup information restored in Configuration Diskette during Express Setup.) If you have a computer other than your servers that is running with Windows 95/98/Me/XP, Windows NT 3.51 or later, or Windows 2000, Windows Server 2003, we recommend you to edit setup information from the computer in advance using Configuration Diskette Creator.

For more information on how to create Configuration Diskette using Configuration Diskette Creator, see Chapter 6.

Microsoft Windows Server 2003

This subsection provides information on installing Microsoft® Windows Server™ 2003 Standard Edition / Microsoft® Windows Server™ 2003 Enterprise Edition in the Server. Read instruction in this section before proceeding the installation.

> **NOTE:** If you install Windows Server 2003 without using Express Setup, see Appendix D.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows Server 2003 correctly.

Supported OS on this model

The server supports the following edition:

- Microsoft Windows Server 2003 Standard Edition / Microsoft Windows Server 2003 Enterprise Edition (hereinafter, referred to as "Windows Server 2003")

On installing other OS, contact sales dealer or the maintenance service representative.

Installing Optional Mass Storage Driver

To install optional mass storage driver, see "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6 to create setup inf file.

BIOS Specification

Before installing Windows Server 2003, confirm if the BIOS specification of the hardware is correct. See Chapter 4 to specify them.

NEC ESMPRO Agent

On Windows Server 2003 systems, the ESMPRO Agent needs the necras.sys driver. To install the necras.sys, run the System update from NEC EXPRESSBUILDER CD-ROM.

Windows Server 2003

Express Setup can install Windows Server 2003 operating system. However, note the following issue:

IMPORTANT:

- Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
- The document for installing Windows Server 2003 is also attached to the other software package which is sold separately from NEC, but refer to this document when you install Windows Server 2003 on this model.
- After completing Express Setup, see "Setup for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".

Installing on the Mirrored Volume

If you want to install Windows Server 2003 on the volume that is mirrored using "Disk Management", invalid the mirroring before operating the installation to set back to the basic disk, and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

Connecting MO Device

If you operate installing Windows Server 2003 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.

Connecting Hard Disk Drive

Connect the hard disk drive that OS is not going to be installed after installing OS.

If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix D).

Creating Partition Size

The minimum size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size
Size necessary to install the system = 2900MB
Paging File Size (Recommended) = Mounted Memory Size × 1.5
Dump file Size = Mounted Memory Size + 12MB

IMPORTANT:

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information (memory dump) may not be collected.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the minimally required partition size will be calculated by the above formula as follows:

2900MB + (512MB * 1.5) + (512MB + 12MB) = 4192MB

Re-installing to the hard disk which has been upgraded to Dynamic Disk

You cannot re-install Windows Server 2003 with the current partition of the hard disk upgraded to Dynamic Disk kept remained.

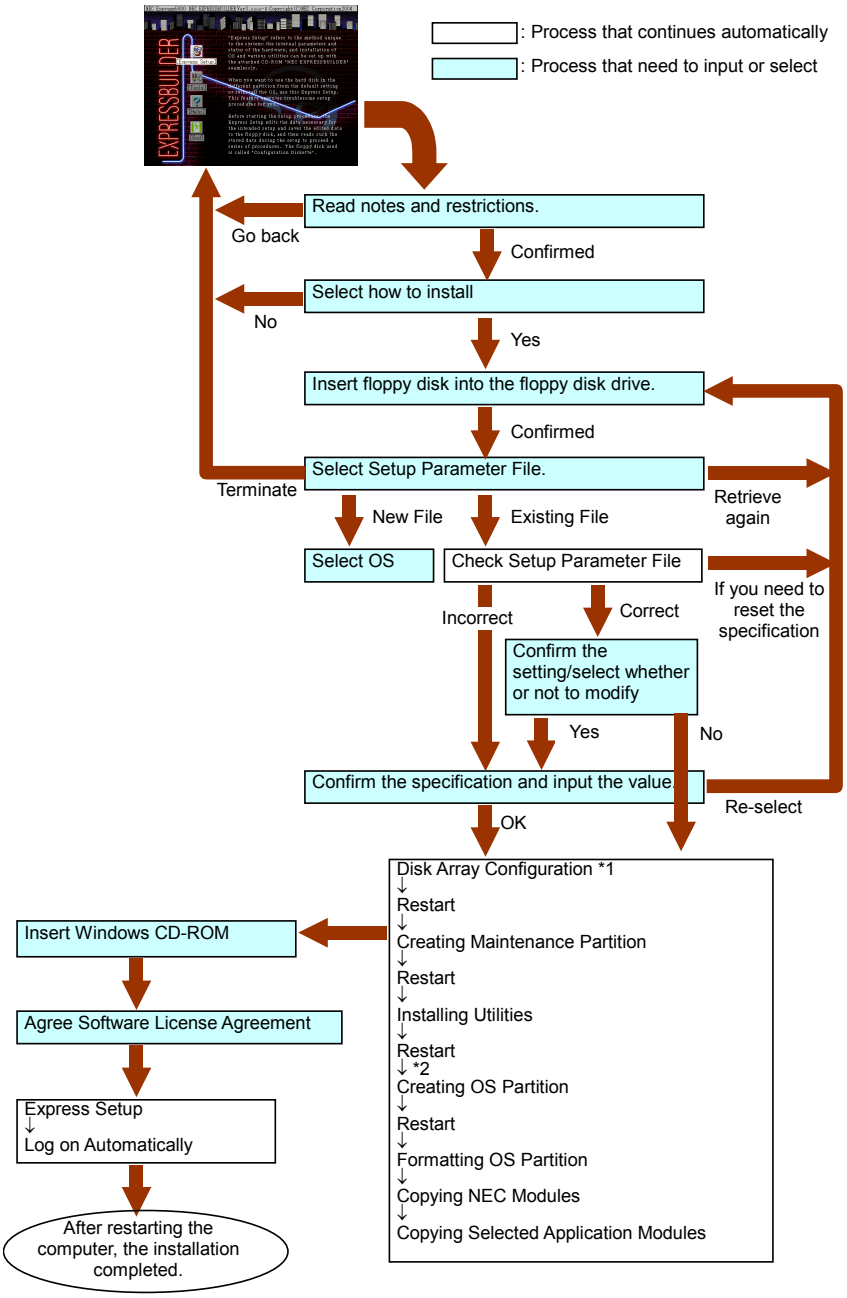
If you want to keep the current partition remained, see Appendix D to re-install the system.

Disk Configuration (Concerning the area displayed as "EISA")

In disk area, an area displayed as "EISA" may exist. This area is maintenance partition for saving configuration information and utilities. Do not delete the area.

The Flow of Setup

This section visually describes the flow of the setup operated by Express Setup.



*1 The process is operated only when Disk Array Controller Board is connected and the configuration is specified.

*2 If you select [Others], the process is completed here.

Installing the Windows Server 2003

This section describes on how to setup the system using Express Setup.

Prepare Configuration Diskette. You can operate the installation if you do not have Configuration Diskette specified in advance, but one floppy disk formatted by MS-DOS 1.44MB is necessary also in such case. For Configuration Diskette, use the blank disk in NEC EXPRESSBUILDER package or prepare other floppy disk personally.

IMPORTANT:

- If you modified the system configuration, execute "System Update".
- If you want to modify or add Graphics Accelerator Driver or the drivers of Network Adapter and so on, see Appendix D.

1. Turn the power of peripheral device on, and then turn on the server.

NOTES:

- If you operate installing Windows Server 2003 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.
- Connect the hard disk drive that OS is not going to be installed after installing OS.
- If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix D).

2. Insert NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Click [Express Setup].

   "Note" will be displayed.
6. Read the instruction carefully and click [OK].

   The message "Insert Configuration Diskette" appears.
7. Insert "Configuration Diskette" into the floppy disk drive and click [OK].

NOTE: If you do not have "Configuration Diskette", insert a blank floppy disk formatted by 1.44MB into the floppy disk drive and click [OK].

[Using the specified Configuration Diskette]

The Setup File included in "Configuration Diskette" will be displayed.

1) Select the Setup File name to use during the installation.

NOTE: If there is any problem that can not be modified in the Setup File you selected, the message to set another "Configuration Diskette" appears. In such case, confirm the floppy disk you inserted.

After the Setup File is specified, the message "Do you want to review or modify the Setup File parameters?" is displayed.

2) If you want to edit the information file, click [Review]. If you do not want to edit the information file and continue the installation, click [Skip].

Click [Review] → Go to step 8.

Click [Skip] → Go to step 9.

[Using Blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

The input box appears.

2) Input the file name.

[Operating System to Install] appears.

The OS supported by the computer is displayed in the list.

3) Select [Windows Server 2003] you want to install from the list box.

8. Confirm the contents specified during OS installation.

If Disk Array Controller Board is connected to Express server mainframe, the [Configure RAID] screen appears. Confirm the specification, modify if necessary, and then click [Next].

Next, [Basic Information] screen appears. Confirm the specification, modify if necessary, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the specification each time if necessary.

IMPORTANT:

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. In the figure below, describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Array" at "New/Existing RAID Configuration".
- If "Create New Partition" at "New/Existing RAID Configuration" is selected, do not specify the value for the partition more than 120GB.
- If you specify other than 4095MB for the "Installing Partition", it is necessary to convert to NTFS.
- If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows Server 2003 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows Server 2003.
- You can not go to the next screen if the specification is incorrect.
- On specification, an error may occur in relationship with the specified contents of the former screen and require to go back to modify the specification.
- During the setup, the screen to specify the partition that Windows Server 2003 is to be installed appears. The first 55MB area displayed on the screen is a partition that is used to store the configuration information or utilities unique of the server. We do not recommend to delete this area, but if you do not want to reserve this 55MB area, perform the installation by manual setup. It is unable to delete this area by Express Setup.
- If you specify other than 120GB for the actual area, you may not create the partition specified as the entire area in sizes more than 120GB.

NOTES:

- If you click [Cancel] in [Basic Information] screen, the screen will go back to select the Setup File. [Cancel] exists only in [Basic Information] screen.
- If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.

When all the specification has completed, the system reboots automatically.

9. Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into the floppy disk drive and follow the message to operate the installation.

10. Follow the message and take NEC EXPRESSBUILDER CD-ROM and Configuration Diskette out of the CD-ROM drive and floppy disk drive, and insert Windows Server 2003 CD-ROM into the CD-ROM drive.

[Software License Agreement] screen appears.

11. Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

IMPORTANT:

- If you do not agree to this agreement, the setup terminates and Windows Server 2003 will not be installed.
- If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.

Now the Setup using Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "PROSET.EXE" in the following directory.

   CD-ROM DriveLetter:\WINNT\DOTNET\BC3\PROSET\WS03XP32

   The [Intel(R) PROSet - Install Shield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

   * The procedure in the case of the classic start menu

     1. Click Start menu, Click [Settings] and Click [Network Connections].

        The [Network Connections] dialog box appears.

     2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

   The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet for Wired Connections] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel] and click [Intel(R) PROSet Wired].

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

2. Click [(Network Adapter Name)] in the list.

3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.

4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

NOTE: We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet)that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-84/103/113), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used.

If you want to utilize optional Network Board (N8104-86/111), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

In case of utilizing (N8104-86/111)

"CD-ROM Drive Letter:\WINNT\DOTNET\BC3\PRO100\WS03XP32"

If the procedure of installation is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

IMPORTANT: If you want to utilize optional Network Board "N8104-103", open the [Advanced] in PROSet window and change the [Offload TCP Segmentation] value to "Off".

Installation of the Optional Network Board Driver

1. Start Device Manager.
2. Click [Network adapters] and Double-Click [(Network Adapter Name)].

   [(Network Adapter Name) Properties] appears.

   NOTE: [(Intel(R) PRO/1000...)] is the name of On-Board adapter.
   All other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location(Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [(N8104-86/111)], specify [CD-ROM driveletter:\WINNT\DOTNET\BC3\PRO1000\WS03XP32]. Then click [Next].
7. Click [Finish].

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] dialog box.

   The [Intel(R) PROSet for Wired Connections] dialog box appears.

2. Put the mouse cursor on "Intel(R) PRO/1000 MT Network Connection" in the list and right-click.

   Pull-down menu appears.

3. Select [Add to Team>] and then click [Create New Team...].

   The [Teaming Wizard] dialog box appears.

4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

Installing SCSI Controller Driver

If you utilize SCSI controller driver (N8103-65F/75F), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] → [Computer Management].
2. Double click the SCSI Controller driver which Device Manager lists as unknown device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].

   [INITIO INI-A10XU2W PCI SCSI Controller] (When N8103-65F board is installed.)

   [Adaptec SCSI Card 29320ALP -Ultra320 SCSI] (When N8103-75F board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Graphics Accelerator Driver

Update Graphics Accelerator Driver mounted in standard.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\VIDEO\RADEON7000\W2K3\SETUP.EXE

   * Install the graphics accelerator driver in the following directory if you communicate your server with the remote KVM console. (Optional advanced remote management card (N8115-02) must be installed in your server to use the remote KVM console.)

   <CD-ROM Drive Letter>:\N8115-02\VIDEO\RADEON7000\SETUP.EXE
4. Follow the message to continue the installation.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

Setting for Solving Problems

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

IMPORTANT: Cautions for the Memory Dump

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
- If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you re-start the system in such case, memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Select [Control Panel] and click [System].

   The [System Properties] dialog box appears.

2. Select [Advanced] tab.

3. Click [Settings] on the [Startup and Recovery] group box.

IMPORTANT:

- To specify "Complete Memory Dump" to write the debug information is recommended.
  If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 12MB".
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.

   e.g. Write the debug information in D drive write the file name "MEMORY.DMP".

   D:\MEMORY.DMP

5. Click [Settings] on the [Performance] group box.

   The [Performance Options] window appears.

6. Click [Advanced] tab on the [Performance Options] window.

7. Click [Change] on the [Virtual memory] group box.

8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than [Recommended], and click [Set].

   IMPORTANT:

   - Be sure to create memory dump with the size described above on the OS partition. If [Default Size] of the paging file is specified to the value smaller than "Recommended" value, the correct debug information (memory dump) may not be collected.
   - For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
   - To prepare for the situation when any trouble occurred, we recommend you to press dump switch to confirm that the dump will be collected normally in advance.
   - In case the memory is expanded, re-specify the paging file to suit the new memory size.

9. Click [OK].

   The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

Windows Dr. Watson

Windows Dr. Watson is a debugger for application errors. If any application error is detected,

Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

   The [Dr. Watson for Windows] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.

   The diagnostic information will be stored with the file name "DRWTSN32.LOG".

   NOTE: You can not specify network pass. Specify the pass on local computer.
4. Specify the location of crash dump file in the [Crash Dump] box.

   NOTE: "Crash Dump File" is a binary file that can be read with Windows Debugger.
5. Check the following check box on the [Option] box.

   ☐ Dump Symbol Table
   ☐ Dump All Thread Contexts
   ☐ Add To Existing Log File
   ☐ Create Crash Dump File

   For more information on each function above, refer to Online Help.
6. Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble. To utilize Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Add/Remove Programs].

   The [Add/Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

   The [Windows Components Wizard] dialog box appears.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks to install the disk, insert Windows Server 2003 CD-ROM into CD-ROM drive and click [OK].

6. Click [Complete] in the [Windows Component Wizard] dialog box.

7. Click [Close] in the [Add/Remove Application] dialog box.

8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your NEC EXPRESSBUILDER CD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

Updating the System

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Setup Software] in [Master Control Menu] screen appears, so left-click the item. Click [Update the System] from the menu and the setup will start. After that, follow the message to continue the setup process.

Making Backup Copies of System Information

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

Exceptional Setup

This section explains how to setup with the exceptional way. You usually do not have to do as follows. If your system has any Mass storage devices, you have to set as follows depending on your system. The detailed information is provided by the manual of the Mass storage device.

Installation of Mass storage device not to be supported by ExpressSetup

If you would like to install or re-install the OS when the system has new mass storage device not to be supported by NEC EXPRESSBUILDER, you have to set as follows.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the NEC EXPRESSBUILDER.
3. Boot the system from NEC EXPRESSBUILDER CD-ROM.
4. (a) When the dialog of Disk array configuration appears, check "Use Existing Array".

   (b) Check "Apply OEM-FD for Mass storage device".
5. Copy the driver for the mass storage device in the ExpressSetup.

   Insert the floppy disk attached the mass storage device into the floppy disk drive.

   Continue the ExpressSetup, referring to messages displayed on the display.

Microsoft Windows 2000

This subsection provides information on installing Microsoft® Windows® 2000 in the server. Read instruction in this section before proceeding the installation.

> **NOTE:** If you install Windows 2000 without using Express Setup, see Appendix D.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows 2000 correctly.

Supported OS on this model

The server supports the following edition:

- Microsoft Windows 2000 Server / Microsoft Windows 2000 Advanced Server (hereinafter, referred to as "Windows 2000")

On installing other OS, contact sales dealer or the maintenance service representative.

Installing Optional Mass Storage Driver

To install optional mass storage driver, see "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6 to create setup inf file.

BIOS Specification

Before installing Windows 2000, confirm if the BIOS specification of the hardware is correct. On BIOS specification, there are some items to specify for the new functions provided from Windows 2000 (Plug and Play, support for USB interface and so on). See Chapter 4 to specify them.

NEC ESMPRO Agent

On Windows 2000 systems, the ESMPRO Agent needs the necras.sys driver. To install the necras.sys, run the System update from NEC EXPRESSBUILDER CD-ROM.

Windows 2000

Express Setup can install Windows 2000 operating system. However, note the following issue:

IMPORTANT:

- Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
- The document for installing Windows 2000 is also attached to the other software package which is sold separately from NEC, but refer to this document when you install Windows 2000 on this model.
- After completing Express Setup, see "Setup for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".

Installing on the Mirrored Volume

If you want to install Windows 2000 on the volume that is mirrored using "Disk Management", invalid the mirroring before operating the installation to set back to the basic disk, and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

Connecting MO Device

If you operate installing Windows 2000 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.

Connecting Hard Disk Drive

Connect the hard disk that OS is not going to be installed after installing OS.

If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix E).

Disk Configuration (Concerning the area displayed as "MAINTE_P")

In disk area, an area displayed as "MAINTE_P" may exist. This area is maintenance partition for saving configuration information and utilities. Do not delete the area.

Creating Partition Size

The minimum size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size
Size necessary to install the system = 1000MB
Paging File Size (Recommended) = Mounted Memory Size × 1.5
Dump file Size = Mounted Memory Size + 12MB

IMPORTANT:

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information (memory dump) may not be collected.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the minimally required partition size will be calculated by the above formula as follows:

1000MB + (512MB * 1.5) + (512MB + 12MB) = 2292MB

NOTES:

If you want to install using Express Setup, calculate the minimally required partition size as follows:

- If you do not apply Windows 2000 Service Pack
  The larger value of either one: 'Minimum Partition Size' described above, or '4095MB'.
- If you want to apply Windows 2000 Service Pack
  The larger value of either one: 'Minimum Partition Size' described above + 850MB or '4095MB'.

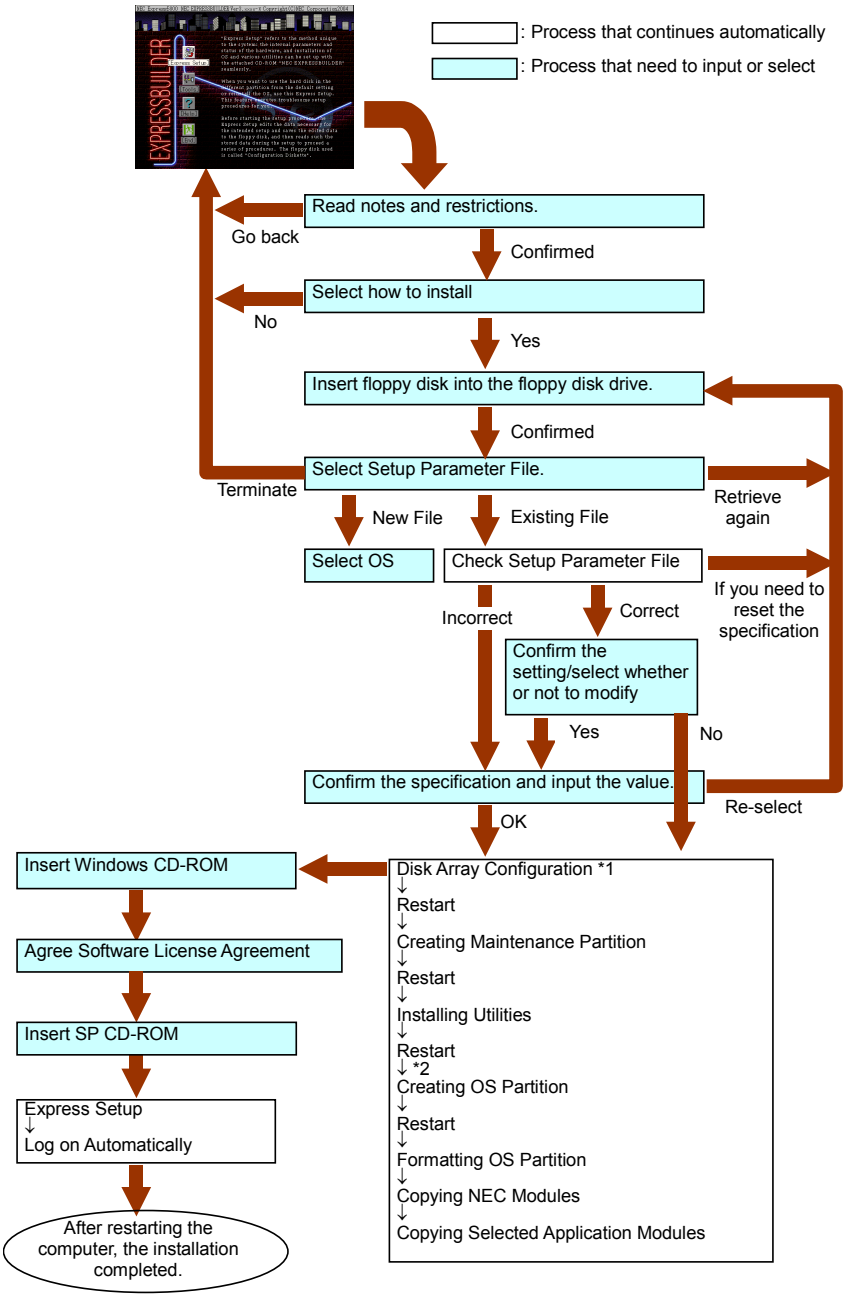
Re-installing to the hard disk which has been upgraded to Dynamic Disk

You cannot re-install Windows 2000 with the current partition of the hard disk upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix D to re-install the system.

The Flow of Setup

This section visually describes the flow of the setup operated by Express Setup.



*1 The process is operated only when Disk Array Controller Board is connected and the configuration is specified.

*2 If you select [Others], the process is completed here.

Installing the Windows 2000

This section describes on how to setup the system using Express Setup.

Prepare Configuration Diskette. You can operate the installation if you do not have Configuration Diskette specified in advance, but one floppy disk formatted by MS-DOS 1.44MB is necessary also in such case. For Configuration Diskette, use the blank disk in NEC EXPRESSBUILDER package or prepare other floppy disk personally.

IMPORTANT:

- If you modified the system configuration, execute "System Update".
- If you want to modify or add Graphics Accelerator Driver or the drivers of Network Adapter and so on, see Appendix D.

1. Turn the power of peripheral device on, and then turn on the server.

NOTES:

- If you operate installing Windows 2000 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.
- Connect the hard disk that OS is not going to be installed after installing OS.
- If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix E).

2. Insert NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Click [Express Setup].

   "Note" will be displayed.
6. Read the instruction carefully and click [OK].

   The message "Insert Configuration Diskette" appears.
7. Insert "Configuration Diskette" into the floppy disk drive and click [OK].

NOTE: If you do not have "Configuration Diskette", insert a blank floppy disk formatted by 1.44MB into the floppy disk drive and click [OK].

[Using the specified Configuration Diskette]

The Setup File included in "Configuration Diskette" will be displayed.

1) Select the Setup File name to use during the installation.

NOTE: If there is any problem that can not be modified in the Setup File you selected, the message to set another "Configuration Diskette" appears. In such case, confirm the floppy disk you inserted.

After the Setup File is specified, the message "Do you want to review or modify the Setup File parameters?" is displayed.

2) If you want to edit the information file, click [Review]. If you do not want to edit the information file and continue the installation, click [Skip].

Click [Review] → Go to step 8.

Click [Skip] → Go to step 9.

[Using Blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

The input box appears.

2) Input the file name.

[Operating System to Install] appears.

The OS supported by the computer is displayed in the list.

3) Select [Windows 2000] you want to install from the list box.

8. Confirm the contents specified during OS installation.

If Disk Array Controller Board is connected to Express server mainframe, the [Configure RAID] screen appears. Confirm the specification, modify if necessary, and then click [Next].

Next, [Basic Information] screen appears. Confirm the specification, modify if necessary, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the specification each time if necessary.

IMPORTANT:

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. In the figure below, describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Array" at "New/Existing RAID Configuration".
- If "Create New Partition" at "New/Existing RAID Configuration" is selected, do not specify the value for the partition more than 120GB.
- If you specify other than 4095MB for the "Installing Partition", it is necessary to convert to NTFS.
- If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows 2000 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows 2000.
- You can not go to the next screen if the specification is incorrect.
- On specification, an error may occur in relationship with the specified contents of the former screen and require to go back to modify the specification.
- During the setup, the screen to specify the partition that Windows 2000 is to be installed appears. The first 55MB area displayed on the screen is a partition that is used to store the configuration information or utilities unique of the server. We do not recommend to delete this area, but if you do not want to reserve this 55MB area, perform the installation by manual setup. It is unable to delete this area by Express Setup.
- If you specify other than 120GB for the actual area, you may not create the partition specified as the entire area in sizes more than 120GB.

NOTES:

- If you click [Cancel] in [Basic Information] screen, the screen will go back to select the Setup File. [Cancel] exists only in [Basic Information] screen.
- If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.

When all the specification has completed, the system reboots automatically.

9. Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into the floppy disk drive and follow the message to operate the installation.

10. Follow the message and take NEC EXPRESSBUILDER CD-ROM and Configuration Diskette out of the CD-ROM drive and floppy disk drive, and insert Windows 2000 CD-ROM into the CD-ROM drive.

[Software License Agreement] screen appears.

11. Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

IMPORTANT:

- If you do not agree to this agreement, the setup terminates and Windows 2000 will not be installed.
- If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.

12. If you selected [Apply] on [Apply Service Pack] at Basic Information, follow the procedure below.

1) Follow the message to take Windows 2000 CD-ROM out of the CD-ROM drive.

2) Follow the message to insert Windows 2000 Service Pack 4 or later into the CD-ROM drive.

Windows 2000 and the specified application will be installed automatically and logon to the system. Install and configure the device drivers.

Now the Setup using Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

PROSet

PROSet is a utility that confirms the function of network contained in network driver. Be sure to install. Utilizing PROSet enables the following issues:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Specify teaming.

Configuring several network adapters as one team provides the server an environment tolerant on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Program], [Accessory] and click [Explorer].
3. Run "PROSET.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\W2K\BC3\PROSET\WIN2K

   The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

[When PROSet is not installed]

1. Click Start menu and click [Network and Dial-Up Connection].

   The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

   The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

   The property dialog box for network adapter appears.

4. Click the [Advanced] and specify the [Link Speed & Duplex]value the same as the value specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

> **NOTE:** We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

[When PROSet is installed]

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

   The [Intel(R) PROSet for Wired Connections] dialog box appears.

2. Put the cursor to the network driver in the list.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

Also specify the other network driver with the same progress above.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-84/111/86/103/113), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

Refer to the re-installation procedure described in Appendix E.

Network Driver for (N8104-86/111)

[CD-ROM Drive Letter:\WINNT\W2K\BC3\PRO100\WIN2K]

Network Driver for (N8104-84/103/113)

[CD-ROM Drive Letter:\WINNT\W2K\BC3\PRO1000\WIN2K]

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] dialog box.
   The [Intel(R) PROSet for Wired Connections] dialog box appears.
2. Put the mouse cursor on "Intel(R) PRO/1000 MT Network Connection" in the list and right-click.
   Pull-down menu appears.
3. Select [Add to Team>] and then click [Create New Team...].
   The [Teaming Wizard] dialog box appears.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

Installing SCSI Controller Driver

If you utilize SCSI controller driver (N8103-65F/75F), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] → [Computer Management].
2. Double click the SCSI Controller driver which Device Manager lists as unknown device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Display a list of the known drivers for this device so that I can choose a specific driver" and click [Next].
5. Select [SCSI and RAID controllers], Click [Have Disk..].
6. Insert "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
7. Specify the following driver and click [Next].

   [INITIO INI-A10XU2W PCI SCSI Controller] (When N8103-65F board is installed.)

   [Adaptec SCSI Card 29320ALP -Ultra320 SCSI] (When N8103-75F board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Graphics Accelerator Driver

Install Graphics Accelerator Driver mounted in standard.

If you want to utilize optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "Setup.exe" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\VIDEO\RADEON7000\W2K\Setup.exe.

   * Install the graphics accelerator driver in the following directory if you communicate your server with the remote KVM console. (Optional advanced remote management card (N8115-02) must be installed in your server to use the remote KVM console.)

   <CD-ROM Drive Letter>:\N8115-02\VIDEO\RADEON7000\Setup.exe
4. Follow the message to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

   If the dialog message "Direct X Ver. 8 isn't installed." appears, select [continue] to continue.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

USB 2.0 Driver

USB 2.0 Driver is pre-installed.

When restoring the system or re-installing the system, the driver is automatically installed in the process of updating the system.

Setting for Solving Problems

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

IMPORTANT: Cautions for the Memory Dump

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
- If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you re-start the system in such case, memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Point to [Settings] in Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [System].

   The [System Properties] dialog box appears.

3. Click [Advanced].

4. Click [Startup and Recovery].

5. Enter the location to write the debug information to the text box.

   e.g. Write the debug information in D drive with the file name "MEMORY.DMP".

   D:\MEMORY.DMP

IMPORTANT:

- To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 12MB".
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

6. Click [Performance Options].
7. Click [Change] on the [Virtual Memory] dialog box.
8. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to the value larger than [Recommended Size], and click [Specify].

IMPORTANT:

- Be sure to create memory dump with the size described above on the OS partition. If [Default Size] of the paging file is specified to the value smaller than "Recommended" value, the correct debug information (memory dump) may not be collected.
- For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
- To prepare for the situation when any trouble occurred, we recommend you to press dump switch to confirm that the dump will be collected normally in advance.
- In case the memory is expanded, re-specify the paging file to suit the new memory size.

9. Click [OK].

   The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

Windows 2000 Dr. Watson

Windows 2000 Dr. Watson is a debugger for application errors. If any application error is detected,

Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

   The [Dr. Watson for Windows 2000] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.

   The diagnostic information will be stored with the file name "DRWTSN32.LOG".

   NOTE: You can not specify network pass. Specify the pass on local computer.
4. Specify the location of crash dump file in the [Crash Dump] box.

   NOTE: "Crash Dump File" is a binary file that can be read with Windows Debugger.
5. Check the following check box on the [Option] box.

   ☐ Dump Symbol Table
   ☐ Dump All Thread Contexts
   ☐ Add To Existing Log File
   ☐ Create Crash Dump File

   For more information on each function above, refer to Online Help.
6. Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble. To utilize Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Add/Remove Programs].

   The [Add/Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

   The [Windows Components Wizard] dialog box appears.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks to install the disk, insert Windows 2000 CD-ROM into the CD-ROM drive and click [OK].

6. Click [Complete] in the [Windows Component Wizard] dialog box.

7. Click [Close] in the [Add/Remove Application] dialog box.

8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your NEC EXPRESSBUILDER CD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

Updating the System - Installing Service Pack -

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Setup Software] in [Master Control Menu] screen appears, so left-click the item. Click [Update the System] from the menu and the setup will start. After that, follow the message to continue the setup process and apply Service Pack.

Making Backup Copies of System Information

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

Exceptional Setup

This section explains how to setup with the exceptional way. You usually do not have to do as follows. If your system has any Mass storage devices, you have to set as follows depending on your system. The detailed information is provided by the manual of the Mass storage device.

Installation of Mass storage device not to be supported by ExpressSetup

If you would like to install or re-install the OS when the system has new mass storage device not to be supported by NEC EXPRESSBUILDER, you have to set as follows.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the NEC EXPRESSBUILDER.
3. Boot the system from NEC EXPRESSBUILDER CD-ROM.
4. (a) When the dialog of Disk array configuration appears, check "Use Existing Array".

   (b) Check "Apply OEM-FD for Mass storage device".
5. Copy the driver for the mass storage device in the ExpressSetup.

   Insert the floppy disk attached the mass storage device into the floppy disk drive.

   Continue the Express Setup, referring to messages displayed on the display.

HostRAID

The following explains the overview of HostRAID and the setup procedure.

Overview of HostRAID

HostRAID provides RAID feature through the Adaptec Ultra320 SCSI interface installed as standard in the system.

HostRAID consists of the driver that controls disk arrays and "Adaptec Storage Manager™ - Browser Edition (hereinafter abbreviated to ASMBE) that is a disk array management utility.

The software products are mandatory for HostRAID to function normally. Be sure to install both software products. For the driver, refer to the setup procedure explained in this manual. For ASMBE, refer to the "Adaptec Storage Manager™ - Browser Edition User's Guide."

Overview of the specifications

Hard disk drive:	Four hard disk drives for each channel + 2 spare drives
RAID level:	RAID0, RAID1, or RAID10 (0 + 1)
Operating system:	Microsoft Windows Server 2003 Standard Edition/Enterprise Edition Microsoft Windows 2000 Server/Advanced Server
Configuration Method of disk arrays:	BIOS utility, NEC EXPRESSBUILDER and ASMBE

Features

- HostRAID supports the hot swap rebuild function for the hot plug insertion (HotSwap) of hard disk drives.
- HostRAID enables the BIOS utility to select the disk array/standard SCSI for each channel.
- Since the JAVA-based management utility ASMBE uses the browser (IE5.5 or later), the software does not need to be installed into each client PC for management. (The software must be installed in each server.)

Notes

The following explains general notes on HostRAID:

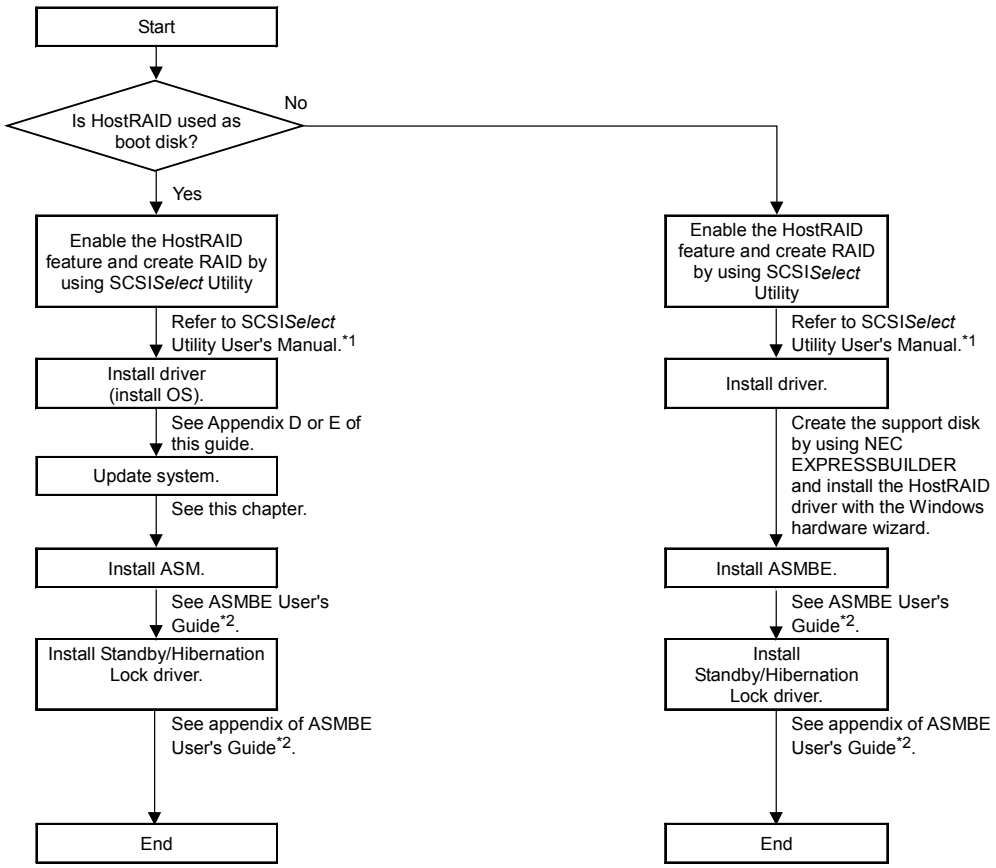
For notes on the BIOS and SCSI*Select* utility, refer to Chapter 4 of this guide or SCSI*Select* Utility User's Manual. For notes on ASMBE, refer to Adaptec Storage Manager™ - Browser Edition User's Guide.

> **NOTE:** You may view or print the SCSI*Select* Utility User's Manual and Adaptec Storage Manager™ - Browser Edition User's Guide from the NEC EXPRESSBUILDER CD-ROM.

- Only a hard disk drive can be connected to a channel with which HostRAID is enabled through SCSI BIOS.
- To connect a device other than a hard disk drive, disable HostRAID and use it as the standard SCSI.
- In addition to driver installation, ASMBE installation is mandatory for using HostRAID functions. For the installation of ASMBE, refer to the "Adaptec Storage Manager™ - Browser Edition User's Guide."
- If you replace a hard disk drive being used with HostRAID, let 60 seconds or more pass after removing the hard disk drive, and then install a new hard disk drive.
  If the interval is too short, an unexpected event may occur. (You should install a new hard disk drive after confirming the removal of the old hard disk drive on the ASMBE window.)
- HostRAID does not permit the use of the standby/hibernation mode of ACPI functions.
- Use ASMBE to maintain HostRAID, but do not use the SCSI*Select* utility.
- After rebuilding by using hot spare, do the rebuilding again to make the installation positions of hard disks and the configuration of an array using the disks same as those before the configuration of the array. Without the operation, the boot priority may be changed. The priority can be changed by the SCSI*Select* Utility.
- Create at least one OS partition in the array you have created. If the OS partition does not exist, the Verify may be executed for the array at the system boot.
- The timeout message below may be recorded into the event log if I/O operation is delayed while HostRAID is running with a high load applied. However, HostRAID internal processing retries the I/O processing, and the delay does not influence AP and system operations.
  Event source: a320raid.sys
  Event ID: 9
  Description: The device \Device\Scsi\a320raid* did not respond within timeout period. (*: Arbitrary)
- When Hot Spare Rebuild is performed, please perform Rebuild again to become the original hard disk mounting position and the same position. If this work is not done, a boot priority may change. A boot priority can be changed in BIOS.
- Please create OS partition, if RAID is created. When there is no OS partition, Verify with Fix may operate.

HostRAID Setup Flow

The flowchart below shows the HostRAID system setup procedure.


Start
Is HostRAID used as boot disk?
No
Yes
Enable the HostRAID feature and create RAID by using SCSI*Select* Utility
Refer to SCSI*Select* Utility User's Manual.*1
Install driver (install OS).
See Appendix D or E of this guide.
Update system.
See this chapter.
Install ASM.
See ASMBE User's Guide*2.
Install Standby/Hibernation Lock driver.
See appendix of ASMBE User's Guide*2.
End
Enable the HostRAID feature and create RAID by using SCSI*Select* Utility
Refer to SCSI*Select* Utility User's Manual.*1
Install driver.
Create the support disk by using NEC EXPRESSBUILDER and install the HostRAID driver with the Windows hardware wizard.
Install ASMBE.
See ASMBE User's Guide*2.
Install Standby/Hibernation Lock driver.
See appendix of ASMBE User's Guide*2.
End

*1 You can create RAID by using the NEC EXPRESSBUILDER. In this case, only you need to do is to set the HostRAID feature to "Enabled" by using SCSI*Select* Utility.

*2 ASMBE User's Guide: Adaptec Storage Manager™ - Browser Edition User's Guide.

You may view or print the SCSI*Select* Utility User's Manual and Adaptec Storage Manager™ - Browser Edition User's Guide from the NEC EXPRESSBUILDER CD-ROM.

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Chapter 6

Installing and Using Utilities

This section describes how to use the NEC EXPRESSBUILDER CD-ROM that comes with your server and to install the utilities stored on the NEC EXPRESSBUILDER.

NEC EXPRESSBUILDER

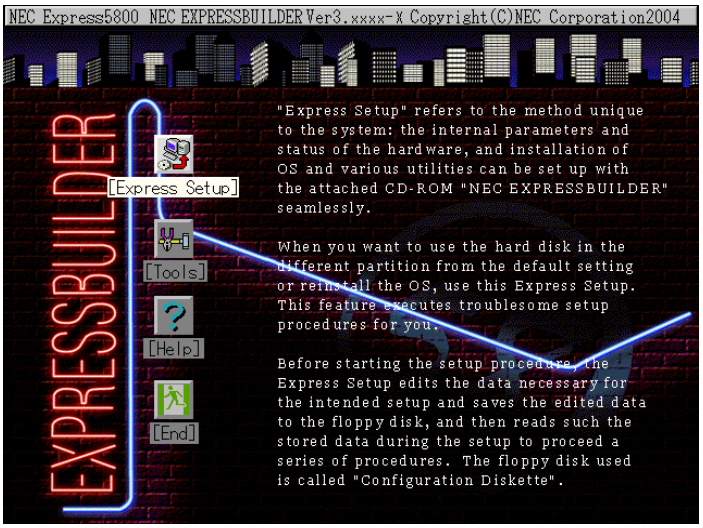
NEC EXPRESSBUILDER is an automated software integration tool to help simplify the process of installing and configuring your server. Shipped with all NEC servers, the NEC EXPRESSBUILDER CD-ROM provides a flexible, guided installation process for system administrators to install Microsoft Windows Server 2003, Microsoft Windows 2000 or other operating systems (contact your service representative for the server certified operating systems).

NOTE: Before using NEC EXPRESSBUILDER for initial setup, complete the hardware configuration.

NEC EXPRESSBUILDER includes three distinct programs. One can be booted under DOS for initial setup, and one is for use under Windows operating system.

- DOS-based with local console

  Used to set up the server at the first time. This program is also used to diagnose the server and to install/uninstall the management utilities on the maintenance partition of the system drive.


NEC Express5800 NEC EXPRESSBUILDER Ver3.xxxx-x Copyright(C)NEC Corporation2004
EXPRESSBUILDER
[Express Setup]
[Tools]
[Help]
[End]
"Express Setup" refers to the method unique to the system: the internal parameters and status of the hardware, and installation of OS and various utilities can be set up with the attached CD-ROM "NEC EXPRESSBUILDER" seamlessly.
When you want to use the hard disk in the different partition from the default setting or reinstall the OS, use this Express Setup. This feature executes troublesome setup procedures for you.
Before starting the setup procedure, the Express Setup edits the data necessary for the intended setup and saves the edited data to the floppy disk, and then reads such the stored data during the setup to proceed a series of procedures. The floppy disk used is called "Configuration Diskette".

- DOS-based with remote console

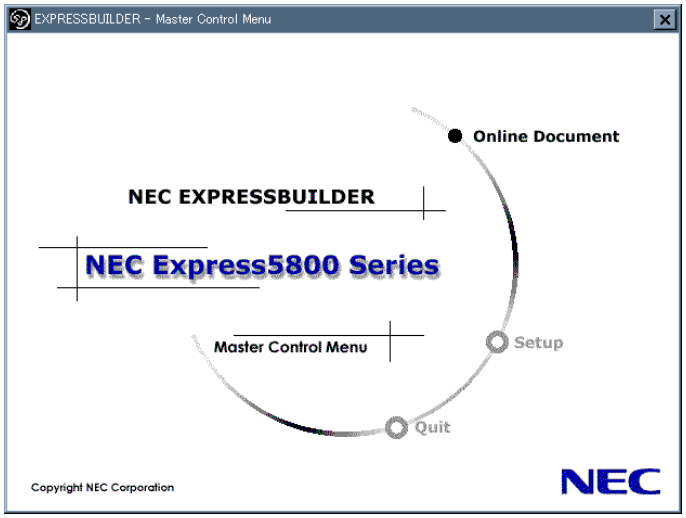
  Used to set up the server from the management workstation by accessing the server over the network or via serial port B.

NOTES:

- This menu is displayed only when an optional remote management card is installed in your system.
- No keyboard connected to the server is permitted to run this program.

- Windows-based

  This program is called as "Master Control Menu" that can run under the Microsoft Windows system (Windows 95 or later and Windows NT 4.0 or later). You can install the several applications and read the documentation from the menu.



NEC EXPRESSBUILDER for DOS-Based with Local Console

This subsection describes the procedures for using NEC EXPRESSBUILDER for DOS-based with local console.

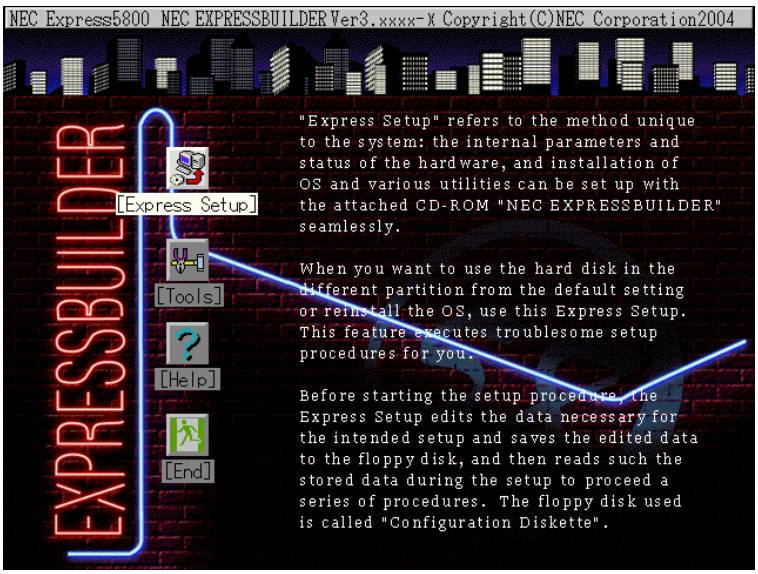
Starting NEC EXPRESSBUILDER

The following procedure instructs you to start NEC EXPRESSBUILDER.

> **IMPORTANT:** Do not remove the NEC EXPRESSBUILDER CD-ROM while NEC EXPRESSBUILDER is running.

1. Turn on peripheral devices and the server in this order.
2. Insert the NEC EXPRESSBUILDER CD-ROM supplied with your server into the CD-ROM drive of your server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   NEC EXPRESSBUILDER boots up displaying the top menu.


NEC Express5800 NEC EXPRESSBUILDER Ver3.xxxx-x Copyright(C)NEC Corporation2004
EXPRESSBUILDER
[Express Setup]
[Tools]
[Help]
[End]
"Express Setup" refers to the method unique to the system: the internal parameters and status of the hardware, and installation of OS and various utilities can be set up with the attached CD-ROM "NEC EXPRESSBUILDER" seamlessly.
When you want to use the hard disk in the different partition from the default setting or reinstall the OS, use this Express Setup. This feature executes troublesome setup procedures for you.
Before starting the setup procedure, the Express Setup edits the data necessary for the intended setup and saves the edited data to the floppy disk, and then reads such the stored data during the setup to proceed a series of procedures. The floppy disk used is called "Configuration Diskette".

Express Setup

"Express Setup" is intended for initial setup of the server. Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen prompts for software selection and configuration. The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

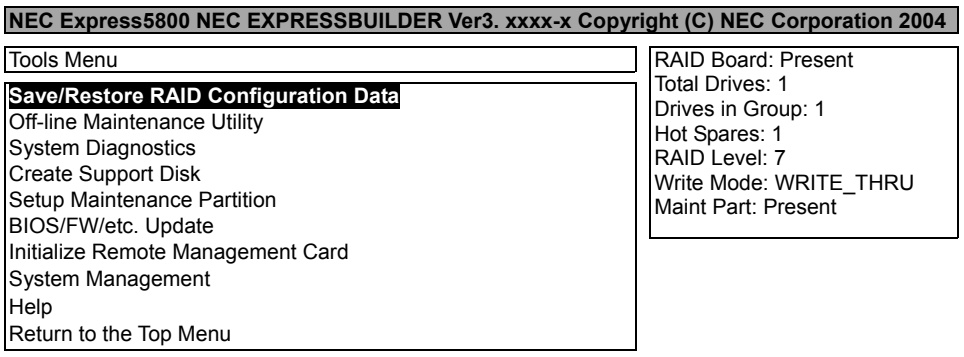
If you install Windows Server 2003 or Windows 2000, after a few tasks are completed, all that remains to be done is to remove the NEC EXPRESSBUILDER CD-ROM and install the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

IMPORTANT:

- The Express Setup is intended for the initial setup of the server system and, therefore, the Express Setup clears the contents of the hard disk.
- Once Express setup is started, do not remove "Configuration Diskette" from the floppy disk drive without any directions.

Tools

"Tools" is also intended for initial setup of the server. It provides more installation options than Express Setup and permits the user to quickly create utility support disks, run the Off-line Maintenance Utility and system diagnostic utility, set up a maintenance partition, and update the various BIOS programs.



- Save/Restore RAID Configuration Data

  The item allows the configuration information on the disk array system to be saved or restored from the floppy disk.

  If the HostRAID and LSI-Logic disk array controller are used together, the configuration information of HostRAID is saved or restored. If the Adaptec Zero channel raid controller (ZCR) and LSI-Logic disk array controller are used together, the configuration information of ZCR is saved or restored.

  IMPORTANT: In these cases, If you want to save or restore the configuration information of LSI-Logic disk array controller, refer to the "Power Console Plus User's Guide".

– Save Disk Array Configuration Data

The configuration information on the disk mirroring controller is saved into the floppy disk. If you set or change RAID, always use this function to save the configuration information into a floppy disk.

IMPORTANT: Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.

– Restore Disk Array Configuration Data

The configuration information saved in a floppy disk is restored to NVRAM and hard disk on the disk mirroring controller.

If the configuration information is broken or changed by mistake, restore the configuration information.

When the defected disk array controller is replaced, the configuration information on the hard disk must be saved into the disk array controller.

However, if the configuration information on the new disk mirroring controller is saved into a hard disk, use this function to restore the configuration information.

IMPORTANT:

- Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.
- This is a function for maintenance. Please do not use it except maintenance.

- Off-line Maintenance Utility

Off-line Maintenance Utility is an OS-independent maintenance program that performs preventive maintenance and error analysis for your server. See Chapter 8 or online help for details.

- System Diagnostics

Executes various tests on the server system to check if the server functions are normal and if the connection between the server and additional board is normal.

After the System Diagnostics is executed, a system check program assigned to each model starts. See Chapter 7 for details.

- Create Support Disk

NEC EXPRESSBUILDER CD-ROM contains a number of device drivers and utilities that you can put on floppy disks and load onto your system.

Using this menu creates a support disk by copying from the NEC EXPRESSBUILDER CD-ROM. If your system has the Windows operating system, you may find it more convenient to use NEC EXPRESSBUILDER for Windows-based to make support disks

Write the displayed title on the floppy disk label, which is useful for management in the future. Customers are to provide a floppy disk to create a support disk.

– Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER

  Creates a support disk for installing Windows Server 2003 Standard Edition and Windows Server 2003 Enterprise Edition. (No need to create this disk when installing the operating system with the Express Setup.)

– Windows 2000 OEM-DISK for NEC EXPRESSBUILDER

  Creates a support disk for installing Windows 2000 Server and Windows 2000 Advanced Server. (No need when installing the operating system with the Express Setup.)

– ROM-DOS Startup FD

  Creates a support disk for starting the ROM-DOS system.

– Off-line Maintenance Utility Bootable FD

  Creates a support disk for activating the Off-line Maintenance Utility.

– System Management FD

  Creates a support disk for activating the System Management.

■ Setup Maintenance Partition

Maintenance partition is a specific partition for the server and created on your system disk. About 55MB of the maintenance partition includes the various maintenance utilities and executable commands.

In this menu, you can create the maintenance partition, install the various utilities, and update the utilities. The maintenance utilities installed in the maintenance partition are system diagnostics, System Management, and Off-line Maintenance Utility.

IMPORTANT:

- Do not reset or turn off the server while the running this menu. If the processing is discontinued, the system becomes unable to start.
- The existence of the maintenance partition may be identified from the operating system. In order to retain the Configuration Data, do not delete the partition.

NOTES:

- The maintenance partition, once created, will not be recreated again.
- When the maintenance partition does not exist, some menu items do not appear.

– Create Maintenance Partition

  NEC EXPRESSBUILDER creates about 55MB of the maintenance partition on the system disk (or disk array system) as work area. The various utilities are installed when the maintenance partition is created successfully or when the maintenance partition is already created.

– Install Maintenance Partition Utilities

  Various utilities are installed in the maintenance partition from the CD-ROM.

– Update Maintenance Partition Utilities

  Various utilities are copied in the Maintenance Partition from the update disk. This menu is only used when the update disk is supplied from your service representative or attached with your system.

– FDISK

  Execute FDISK command of ROM-DOS system. You can create/delete partitions, etc.

■ BIOS/FW/etc. Update

This menu allows you to update the software module such as BIOS and firmware of the server by using the update disk (3.5-inch floppy disk) that is distributed from NEC customer service representative.

After rebooting the system, an update program is started automatically from the floppy disk, and the various BIOS and firmware programs are updated.

IMPORTANT: Do not turn off the server while the update program is running. If the update processing is discontinued, the system becomes unable to start.

■ Initialize Remote Management Card

"Initialize Remote Management Card" is used to configure the Remote Management Card with correct parameters of the system installed it.

IMPORTANT: This menu is indicated when optional Remote Management Card is attached.

■ System Management

The parameters of BMC (Baseboard Management Controller) are set for remote control and alert.

IMPORTANT: This menu is indicated when optional Remote Management Card is attached.

■ Help

Displays explanations about various functions of NEC EXPRESSBUILDER.

■ Return to the Top Menu

Choosing this menu returns to the Top Menu.

NEC EXPRESSBUILDER for DOS-based with Remote Console

This subsection describes the procedures for using NEC EXPRESSBUILDER for DOS-based with remote console.

NEC EXPRESSBUILDER contains the remote console feature that allows the system administrator to set up the server from the management workstation (management PC) via the network or the server's COM B (serial) port.

IMPORTANT:

- Do not use this feature on any other computer than the server, or on any other server obtained without the NEC EXPRESSBUILDER. Doing so may cause a failure of the server.
- When a keyboard is connected to the server, the remote console feature is disabled. The NEC EXPRESSBUILDER determines that the server has a console. (Nothing is displayed on the management PC.)
- If you fail to configure the disk array controller N8103-80F or 81F from the remote console, try again using the server console.
- The system may fail to operate with the transfer rate of 115.2 Kbps for serial console redirection. Specify any other transfer rate than 115.2 Kbps.

Starting

The following two methods are available to start the server.

- Running NEC EXPRESSBUILDER from the management PC via LAN
- Running NEC EXPRESSBUILDER from the management PC via direct connection (COM B)

For the procedure for starting NEC EXPRESSBUILDER for DOS-based with Remote Console, see "NEC DianaScope".

IMPORTANT:

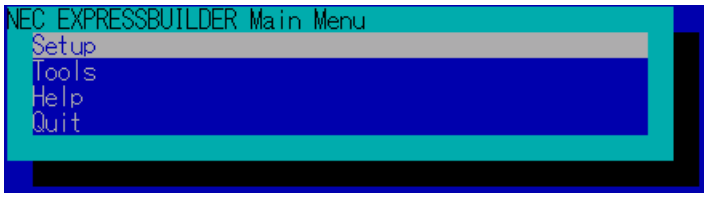
- Do not change the boot device order in BOOT menu in BIOS SETUP. NEC EXPRESSBUILDER cannot be used if the CD-ROM drive is not the first device to launch the system.
- To use this feature, you need 3.5-inch floppy disk. Please prepare the floppy disk.

NOTE: The following items of BIOS setup information will be set as shown below.

- LAN Controller: [Enabled]
- Serial Port A: [Enabled]
  Base I/O Address: [3F8]
  Interrupt: [IRQ 4]
- Serial Port B: [Enabled]
  Base I/O Address: [2F8]
  Interrupt: [IRQ 3]
- BIOS Redirection Port: [Serial B]
- Baud Rate: [19.2K]
- Flow Control: [CTS/RTS]
- Console Type: [PC ANSI]

Main Menu

Shown below are the main menu items.



- Setup

  Automatically sets up the server.

- Tools

  Launch the features of NEC EXPRESSBUILDER individually.

- Help

  Help message on NEC EXPRESSBUILDER.

- Quit

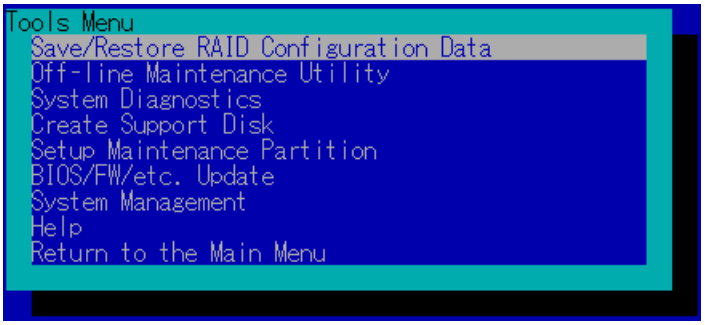
  Quit NEC EXPRESSBUILDER.

Setup

The NEC EXPRESSBUILDER checks the hardware configuration of the server. The disk array and maintenance partition are automatically configured.

Tools

When you select the [Tools] on the Main Menu, the following screen appears.



The menu items available only in remote console operation among those described in section "NEC EXPRESSBUILDER for DOS-based with Local Console" are displayed. See the previous subsection for detailed explanation of menu items.

IMPORTANT: The followings are varied from the [Tools] menu in the local console mode.

- Test items and operation method of System Diagnostics. See Chapter 7 for details.
- Type of disks to be created in [Create Support Disk]

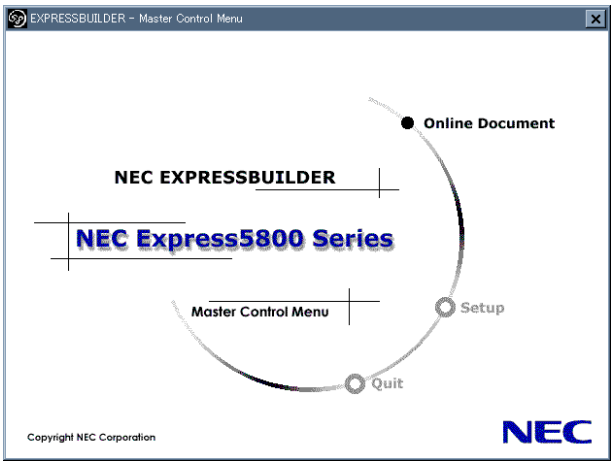
NEC EXPRESSBUILDER for Windows-Based (Master Control Menu)

The Master Control Menu is used to,

- Read documentation,
- Install the management software, and
- Install the viewer application (Adobe Acrobat Reader).

NOTES:

- Master Control Menu requires Microsoft Windows 95 (or later) or Windows NT 4.0 (or later).
- Some documents are provided in the PDF format. Use the Adobe Acrobat Reader to read these documents.



Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive. Master Control Menu appears on the screen automatically. If the Autorun function is invalid in your system, run the \MC\1ST.EXE file in the CD-ROM directly. Some items are grayed-out when the logon user does not have the authority of the administrator or the item is not proper for the system.

To use Master Control Menu,

- Click on [Online Document], [Setup] or [Quit], or
- Click the right mouse button on Master Control Menu window.

CONFIGURATION DISKETTE CREATOR

"Configuration Diskette Creator" is a tool to create [Configuration Diskette] that is used for configuring the server with the Express Setup (see Chapter 5 for details).

If you use the Configuration Diskette created by the Express Setup and Configuration Diskette Creator to operate the setup, you can setup from the installation of OS to several utilities automatically except for a few key input to confirm the specification. Also, you can install the system with the same specification as before when re-installing the system. We recommend you to create [Configuration Diskette] to setup the servers from NEC EXPRESSBUILDER.

> **NOTE:** You can install Windows Server 2003 and Windows 2000 without [Configuration Diskette]. Also, you can modify/newly create [Configuration Diskette] during the setup with NEC EXPRESSBUILDER.

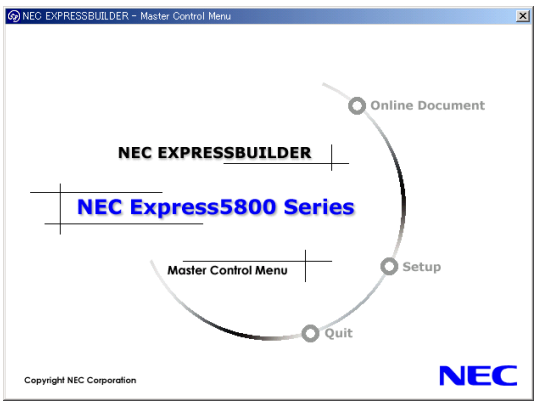
Creating Configuration Diskette

This section describes about specifying setup information that is necessary for OS installation and creating [Configuration Diskette]. Follow the procedure below.

> **NOTE:** In the procedure below, the folder name that is specified when installing Trekking command is assumed as [Configuration Diskette Creator].

1. Start the OS.
2. Insert the attached NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu will appear.
3. Right-click on the screen or left-click [Setup]. The menu will appear.

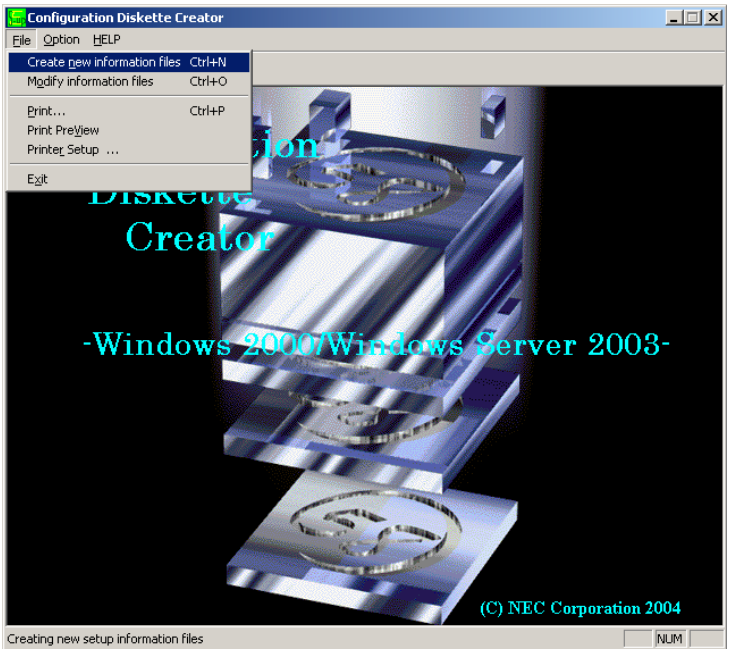


4. Click [Configuration Diskette Creator].

   Configuration Diskette Creator window is displayed.

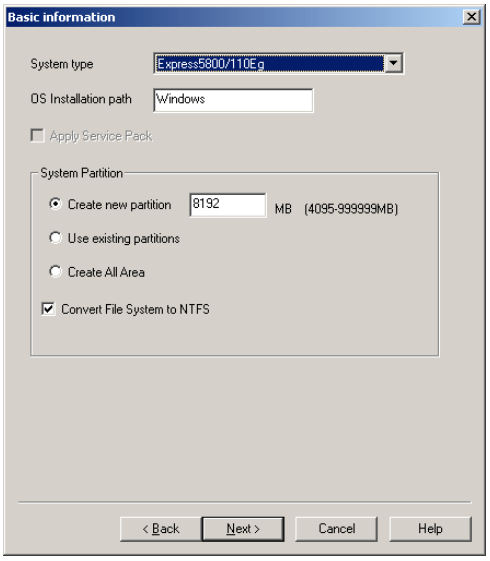
5. Click [Create New Information files] from the [File] menu.

The [Disk Environment] dialog box will be displayed.



6. Specify each item and click [OK].

The dialog boxes to specify setup information will be displayed in order, such as [Basic Information] dialog box.

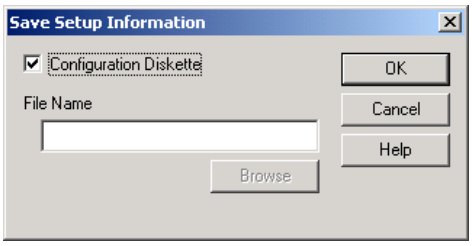


7. Follow the message to specify each item on the dialog box and click [Next].

NOTE: If you click [Cancel], all the input value will be deleted.

When completing the specification of setup information, the [Save the Files] dialog box will appear.

8. Confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].



9. Insert the floppy disk formatted by 1.44MB into the floppy disk drive and click [OK].

Now [Configuration Diskette] has been created. [Configuration Diskette] is used when you install Windows Server 2003 or Windows 2000. Put a label and keep it where it will not be lost.

NOTE: For the information on the contents of each specifying item, refer to the Help.

If you want to modify the information file that already exists, click [Modify information files] on Configuration Diskette Creator window. Refer to the Help to modify the inf file.

NEC ESMPRO

The NEC ESMPRO (referred to as ESMPRO hereafter) lets a system administrator manage remote servers across a network. ESMPRO monitors server hardware and software configurations, failures, and performance. With log data collected by ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, create graphs to record trends, and check server failure rates. The administrator can use the information collected to create more efficient data routing procedures and optimize server usage.

Functions and Features

The ESMPRO offers many functions and features for managing remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of ESMPRO Manager include:

- Hardware and software server configuration
  - Hardware resources mounted in servers, such as the CPU, memory, disks, disk arrays, and LAN boards.
  - Software resources, such as operating system information and drivers running on each server.
- Server failures
  - On-screen real-time displays provide the system administrator with the failure type, location, cause, and suggested corrective action.
  - Failure data includes hardware failure information such as system board temperature, memory failure, crashes, and software failure information.
- Performance
  - ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

For installation procedure and detailed explanations on NEC ESMPRO, refer to the online document in the NEC EXPRESSBUILDER CD-ROM.

Adaptec Storage Manager

Adaptec Storage Manager™ - Browser Edition (hereinafter abbreviated to ASMBE) is a Web-based application that locally or remotely manages HostRAID storage system and provides RAID functions through the SCSI interface in your server. You can use the following functions for HostRAID by installing ASMBE in your system.

Features

- Creating disks at a level of RAID0, RAID1, or RAID10
- Creating Hot Spare disks that are to be used for automatically executing Rebuild if a redundant disk array enters the Degraded state
- Making a consistency check on redundant disk arrays
- Recording HostRAID events into the event log
- Omitting the installation of client software into each management PC if the previously mentioned browser is installed. This is because ASMBE uses the browser (Internet Explorer 5.5 or later).

Before attempting to operate ASMBE, read the "Adaptec Storage Manager™ - Browser Edition User's Guide" included in NEC EXPRESSBUILDER CD-ROM. The manual explains the ASMBE installation procedure and notes on operating ASMBE.

Power Console Plus

Power Console Plus is a utility to control the RAID system of the disk array controller (MegaRAID controller) produced by LSI Logic. Use of Power Console Plus enables operations (e.g., monitoring and maintenance) of RAID systems that are constructed on local NEC Express servers and NEC Express servers connected through networks (TCP/IP). The operations can be done online on graphical screens without the system being stopped.

Major Functions

Power Console Plus has the following features:

- Supporting the Wizard function to facilitate configuration
- Enabling the change of RAID levels
- Being compatible with SAF-TE
- Supporting the performance monitor
- Supporting enclosure functions such as temperature monitoring, power monitoring, and fan monitoring
- Enabling the settings of Write, Read, and Cache policies for each logical drive
- Supporting the save and restore functions for configuration
- Enabling the display of the SCSI transfer rate

Components

Power Console Plus consists of the following five components:

- SNMP Agent

  This function is not yet supported. Do not install SNMP Agent.

- MegaRAID Service Monitor

  Enables NEC ESMPRO to monitor the MegaRAID controller by registering event logs. Install MegaRAID Service Monitor in the NEC Express server in which the MegaRAID controller is mounted.

- MegaRAID Client

  Controls the RAID system on graphical screens. Install MegaRAID Client in the NEC Express server in which the MegaRAID controller mounted or in the management PC that is connected through the NEC Express server and network.

- MegaRAID Server

  Enables control of the MegaRAID controller via the network. Install MegaRAID Server in the NEC Express server in which the MegaRAID controller mounted.

- MegaRAID Registration Server

  Enables control of the MegaRAID controller via the network. Install in one of NEC Express servers and management PCs that are connected through network. The above components must be installed correctly for establishing the environment to use Power Console Plus.

Power Console Plus components to be installed are different between the target servers and management PC.

- Server:
  NEC Express server in which the MegaRAID controller is mounted

  Install the following three components in this server:

  – MegaRAID Service Monitor

  – MegaRAID Server

  – MegaRAID Client

- Management PC:
  Management PC that monitors and controls servers via the network (TCP/IP)

  When managing array on Terminal Server working on Windows NT Server Version 4.0 Terminal Server Edition, prepare PC, and install Management PC component. Management PC does not guarantee operation on Client, which used Terminal Server, Terminal Server Emulator, WBT.

  Start Power Console Plus of management PC, after the Power On machine that installed "Server" and "Management Server".

  Install the following component in this PC:

  – MegaRAID Client

- Management server:
  Machine that manages all servers that are monitored and controlled by management PCs

  Install the following component in one of the servers or management PCs:

  – MegaRAID Registration Server

Server Setup

This section explains Power Console Plus setup in the NEC Express server in which the MegaRAID controller is mounted.

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a server.

- Hardware
  - Machine:

    NEC Express5800 series connected with the AMI disk array controller (A)
  - Memory:

    Size large enough for OS operation + 8MB or more
  - Free space of the hard disk:

    5MB or more
  - Display unit:

    Screen size 1024 × 768 or larger
  - Required peripheral equipment:

    Network Interface card

    CD-ROM unit

    Pointing device such as a mouse
- Software
  - Microsoft Windows Server 2003
  - Microsoft Windows 2000
  - Microsoft Windows XP

Management PC Setup

This section explains Power Console Plus setup in a computer that manages servers via the network (TCP/IP).

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a management PC.

- Hardware
  - Machine:

    NEC Express5800 series

    PC/AT-compatible machine (which contains Intel Pentium or a CPU at least equivalent to it)
  - Memory:

    Size large enough for OS operation + 8MB or more
  - Free space of the hard disk:

    5 MB or more
  - Display unit:

    Screen size 1024 × 768 or larger
  - Required peripheral equipment:

    Network Interface card

    CD-ROM unit

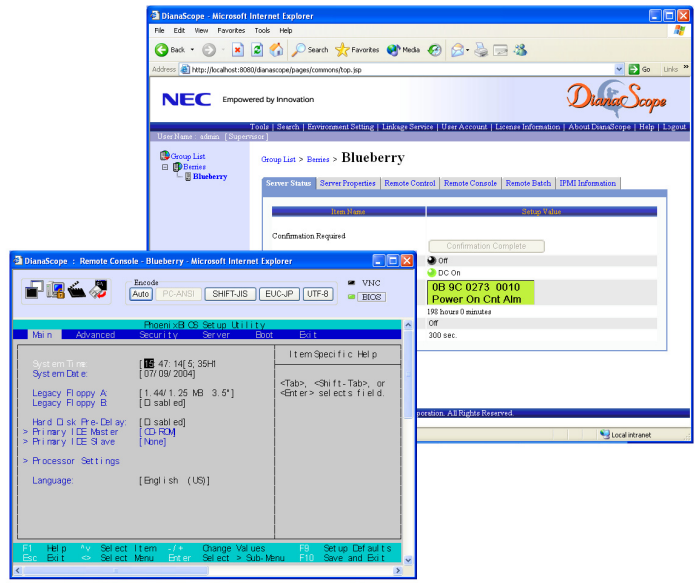
    Pointing device such as a mouse
- Software
  - Microsoft Windows Server 2003
  - Microsoft Windows 2000
  - Microsoft Windows XP
  - Microsoft Windows 95/98/Me (Internet Explorer 5.5 or later)
  - Microsoft Windows NT Version 4.0

    (Windows NT Version 4.0 Service Pack 6a + Internet Explorer 5.5 or later)

NEC DianaScope

The NEC DianaScope is a software for the remote management of the NEC Express5800 series.

See the online documents for details on the functions and installation of the NEC DianaScope.



NOTE: To activate NEC DianaScope, purchase the following license key.

- UL1198-001E SystemGlobe DianaScope Additional Server License (1)
- UL1198-011E SystemGlobe DianaScope Additional Server License (10)

Notes

The online documents explain general information about servers to be managed by the NEC DianaScope.

This section explains specific notes on managing this product remotely from the NEC DianaScope.

- This product can be managed remotely from the NEC DianaScope only when it is equipped with a "Remote Management Card" or "Advanced Remote Management Card" that is an optional product.
- This product does not support the remote FD function.
- This product does not support the chassis ID function. "Identify Chassis" command issued on the NEC DianaScope is executed normally, but some operations such as turning on the unit ID lamp on the this product are not performed.

BMC ONLINE UPDATE

The optional remote management card includes the Baseboard Management Controller (BMC) firmware.

The BMC firmware is updated with the BMC Firmware file.

NOTE: When the remote management card is installed in the system, you can use.

IMPORTANT: Do not turn DC off during BMC Firmware is updated. The BMC firmware which is renewed becomes effective after restarting the system.

Update procedure

1. Insert NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu of NEC EXPRESSBUILDER will be automatically displayed.

2. Select [BMC Online Update].

   BMC Online Update installer will be started. Follow the installer directions to install.

Chapter 7

Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

MAKING BACKUP COPIES

NEC recommends you make backup copies of your valuable data stored in hard disks of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your sales agent.

When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

Also make a backup copy of the disk array configuration data if your system is in the array configuration. When your hard disks have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data. To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional disk array controller board. Refer to the manual supplied with the board.

CLEANING

Clean the server on a regular basis to keep the server in a good shape.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not look into the CD-ROM drive.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Avoid installation in extreme temperature conditions.
- Make sure to complete board installation.
- Protect the unused connectors with the protective cap.

Cleaning the Server

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

IMPORTANT:

- To avoid altering the material and color of the server, do not use volatile solvents such as thinner and benzene to clean the server.
- The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.

1. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, wipe the server with it once again.
7. Wipe the server with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

Cleaning the Interior

One of the most important items in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the mother board.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

Cleaning the interior of the server entails powering off the server and removing the left side cover. You will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush for cleaning the interior.

Follow the procedure below to clean the interior of the server.

⚠ WARNING

Unplug all power cords.

Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged.

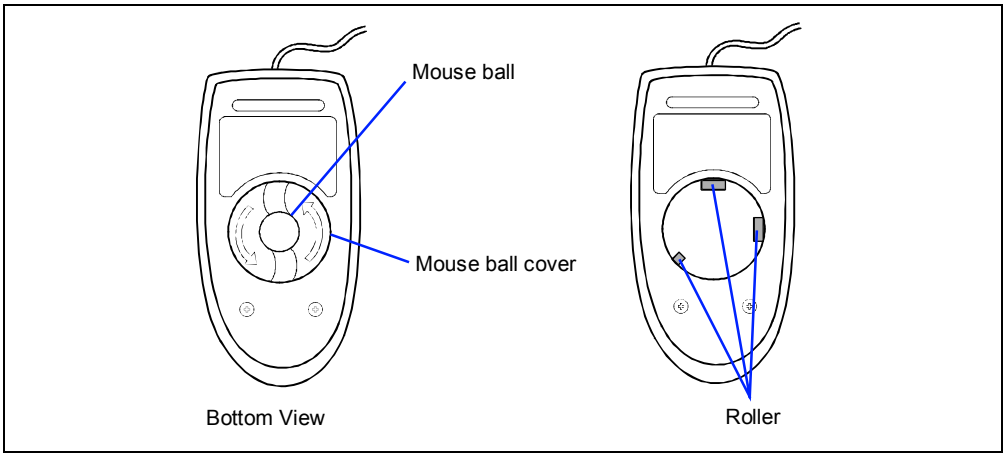
1. Turn off the server and unplug all power cables.
2. Remove the left side cover. (See Chapter 9.)
3. Use a small brush to loosen any dust and debris on the mother board.
4. Use computer grade canned air to blow dust off components on the mother board.
5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
6. Reinstall the left side cover. (See Chapter 9.)
7. Reconnect all power cables and turn on the server.

Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are all off-powered (the POWER/SLEEP lamp goes off), and then wipe the keyboard surface with a dry cloth.

The mouse operation depends on the degree of smoothness of the internal ball rotation. To keep the mouse ball clean, use the mouse in a place with little dust. Follow the steps below to clean the mouse regularly:

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.
2. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).
3. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.
4. Take out the ball from the mouse. Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.



5. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
6. Rub off stains on the mouse ball. Softly wipe the mouse ball with the cloth prepared in Step 5.
7. Wipe the mouse ball with a dry soft cloth.
8. Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.
9. Blow out any dust from the mouse. Protect your eyes from the dust.
10. Put the mouse ball back into the mouse.
11. Place the mouse ball cover, and rotate it clockwise until it is locked.

Cleaning CD-ROM

A dusty CD-ROM or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and CD-ROM regularly:

1. Make sure that the server is powered (the POWER/SLEEP lamp is lit).
2. Press the CD tray Open/Close button on the front of the CD-ROM drive. The tray opens.
3. Hold the CD-ROM lightly and take it out from the tray.

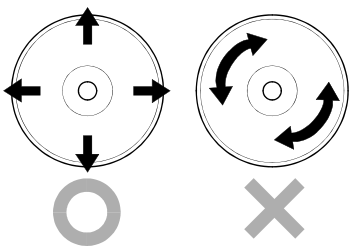
> **NOTE:** Do not touch the signal side of the CD-ROM with your hand.

4. Wipe the tray with a dry soft cloth.

> **IMPORTANT:** Do not wipe the lens of the CD-ROM drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Push on the tray front to close the tray.
6. Wipe the signal side of the CD-ROM with a dry soft cloth.

> **IMPORTANT:** Wipe CD-ROMs from the center to the outside. Use only CD-ROM cleaner if necessary. Cleaning a CD-ROM with record spray/cleaner, benzene, or thinner causes damage to the CD-ROM contents. At worst, inserting the CD-ROM into the server may cause failure.



SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

Use the System Diagnostics program in the NEC EXPRESSBUILDER provided with the server to diagnose the server.

Test Items

The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk used as a system

IMPORTANT: When executing the System Diagnostics, make sure to remove the LAN cable. Executing the System Diagnostics with the LAN cable connected, the network may be influenced.

NOTE: On checking the hard disk, no data is written into the disk.

Starting and Ending the System Diagnostics

There are two ways to diagnose the server: to use the local console(keyboard) of the server itself, and to use the management PC via serial port(remote console).

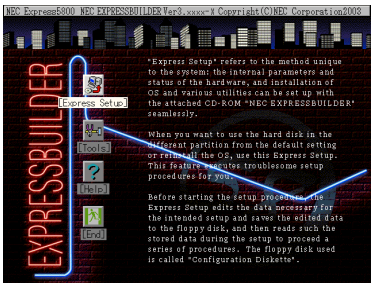
> **IMPORTANT:** Two methods of LAN and the serial port are mentioned in Chapter 6 "NEC EXPRESSBUILDER" in the way of communicating in remote console. Use the serial port to execute System Diagnostics with remote console. The LAN connection is not for System Diagnostics.

Procedures to start the diagnostics program is as follows:

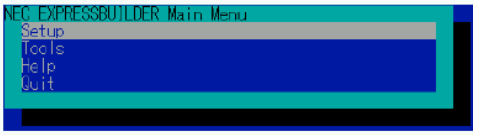
1. Shutdown the OS, and turn off the server. Then, unplug the power cord.
2. Disconnect all the LAN cables from the server.
3. Plug the power cord and turn on the server.
4. Use the NEC EXPRESSBUILDER CD-ROM to reboot the server.

   See the Chapter 6 "NEC EXPRESSBUILDER" for details.

   The following menu appears when started the server using the NEC EXPRESSBUILDER.



Local console



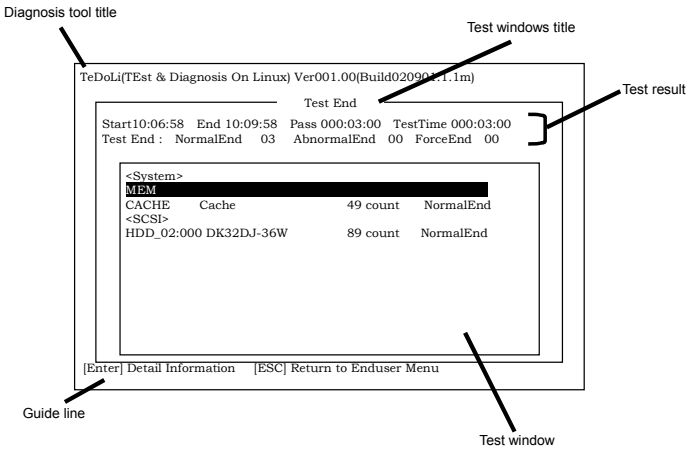
Remote console

5. Select [Tools].

6. Select [System Diagnostics].

The System Diagnostics starts and completes in approximately three minutes.

When the diagnosis completes, the test window title shows "Test End", as the following figure.


Diagnosis tool title
Test windows title
TeDoLi(TEst & Diagnosis On Linux) Ver001.00(Build020903:1.1m)
Test End
Test result
Start10:06:58 End 10:09:58 Pass 000:03:00 TestTime 000:03:00
Test End : NormalEnd 03 AbnormalEnd 00 ForceEnd 00
<System>
MEM
CACHE Cache 49 count NormalEnd
<SCSI>
HDD_02:000 DK32DJ-36W 89 count NormalEnd
[Enter] Detail Information [ESC] Return to Enduser Menu
Guide line
Test window

Diagnosis tool title: shows a name of this diagnosis and Version information.

Test windows title: shows the progress of diagnosis. When it completes, it shows "Test End"

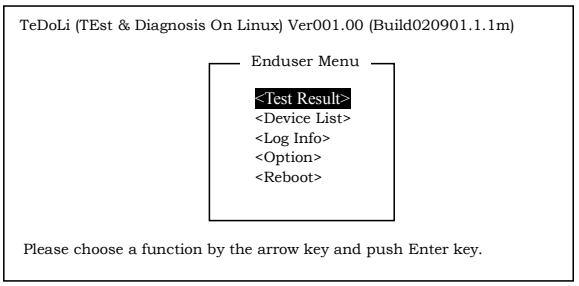
Test Result: shows the information including time of start, end and progress, and result of the diagnosis.

Guide line: shows a description of keys to navigate the window.

Test window: Move the cursor and press Enter to view the detail of the diagnosis.

If an error is detected during the System Diagnostics, the test result shows "Abnormal End" in red color. Move the cursor and press Enter on the diagnosis which error occurred. Take a note of the error message showed, and contact your sales agent.

7. Follow the Guide line showed in the bottom of the screen and press ESC to show the End user Menu showed below.



<Test Result> shows the screen of the diagnosis completed aforementioned.

<Device List> shows the information of all the devices connected.

<Log Info> shows the log information and error messages of the diagnosis. It can be saved to a floppy disk. To save the log information to a floppy disk, insert a formatted floppy disk to a floppy disk drive and select <Save[F]>.

<Option> change where to output log

<Reboot> Restarts the Express Server.

8. Select <Reboot> in the End user Menu above.

   The Express Server restarts, and NEC EXPRESSBUILDER boot the system.

9. Exit the NEC EXPRESSBUILDER, and remove the CD-ROM from the CD-ROM drive.
10. Turn off the server and unplug the power cord from the receptacle.
11. Reconnect all the LAN cables to the server.
12. Plug the power code.

This completes the System Diagnostics.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store the server:

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Never attempt to lift the server only by yourself.
- Do not install the server in any place other than specified.
- Do not connect/disconnect any interface cable with the power cord of the server plugged to a power source.

IMPORTANT:

- If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact the sales agent.
- Make sure to make a backup copy of your valuable data in the hard disk, if any.
- Make sure not to apply a shock to hard disks to relocated the server if the contains any.

1. Take a floppy disk and a CD-ROM out of the server, if any.
2. Power off the server (the POWER/SLEEP lamp goes off).
3. Unplug the power cord of the server from a power outlet.
4. Remove all the cables from the server.
5. Hold the server by its bottom with at least three persons to carry the server.

IMPORTANT: Do not hold the front door to lift the server. The front door may be disengaged from the server, causing personal injury.

6. Protect the server with the shock-absorbing materials, and pack it securely.

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Chapter 8

Troubleshooting

If your server does not operate as expected, read this chapter before assuming a failure.

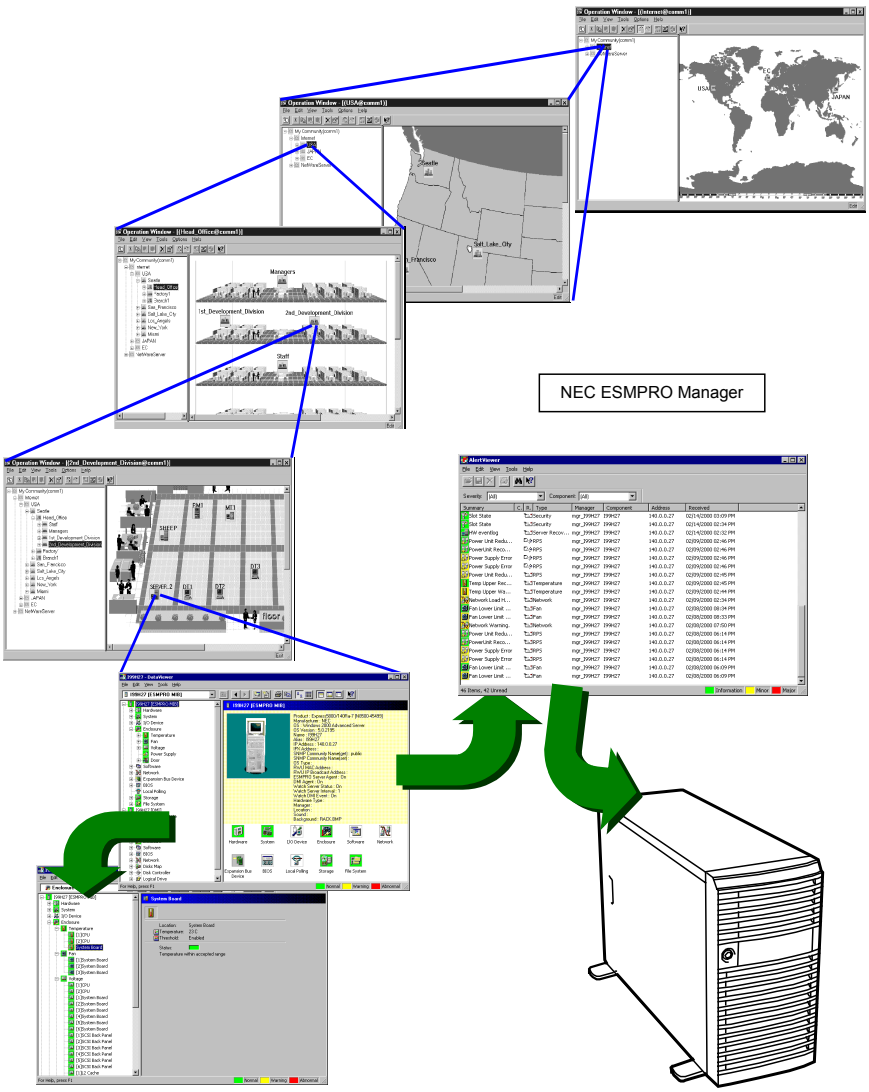
> **NOTE:** For provision against an unexpected failure, it is recommended to install the Off-line Maintenance Utility, NEC ESMPRO, to the server and client computers.

SYSTEM VIEWERS

Monitor the occurrence of fault by NEC ESMPRO during the system operation.

Especially take note on whether any alert is reported to NEC ESMPRO Manager on the management PC. Check whether any alert is reported on the Operation Window, Data Viewer, or Alert Viewer of NEC ESMPRO Manager.

[Example]



LAMPS

The following describes lamps on the server and their indications. See Chapter 2 for each location.

LAN ACCESS Lamp (1)

The LAN ACCESS lamp is lit green when the server is connected to LAN. The lamp blinks while the server is accessed through the LAN (for packet transmission). The value next to the icon indicates the number of the network port on the rear panel.

STATUS Lamp (⚠)

The STATUS lamp stays lit in green when the server is in successful operation. When the STATUS lamp is unlit or lit/flashing in amber, it indicates that the server has failed.

The following table lists indications of the STATUS lamp, descriptions, and actions to take.

NOTES:

- If the server has the NEC ESMPRO or Off-line Maintenance Utility installed, you can view the error log to identify the cause of a trouble.
- To cycle power to the server, shut down the server from the OS to and reboot it, if available. If the shutdown from the OS is not available, disconnect and connect the power cord to reboot the server.

STATUS lamp indication	Description	Procedure
On (green)	The server is operating normally.	–
Flashing (green)	• The server is operating with the memory, CPU, or power supply unit in degraded state. • A single-bit memory error has often occurred.	Check the AC POWER lamp indication on the rear panel of the server. Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off*	The power is off.	–
	POST is in progress.	Wait for a while. The STATUS lamp turns green when POST is completed.
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays an error message, take notes of the message, and contact your sales representative.
	A CPU temperature alarm was detected. (Thermal-Trip)	
	A timeout occurred when the time set for the watchdog timer arrived.	
	A CPU bus error occurred.	
	A memory dump request is made.	Wait until the memory dump is completed.
On (amber)*	A temperature alarm was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are normal, contact your sales representative.
	A voltage alarm was detected.	Contact your sales representative.
	All the power supply units failed.	
Flashing (amber)*	Either of the following was detected in the redundant power configuration: • AC power not supplied to one of the two power supply units • Failure of one of the two power supply units	Connect the power cord to supply power. If the power supply unit is faulty, contact your sales representative.
	A fan alarm was detected.	Check if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are normal, contact your sales representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are normal, contact your sales representative.
	A power supply alarm was detected.	Contact your sales representative.

* Indicates only when the optional remote management card is installed in your system.

POWER/SLEEP Lamp ( )

The green POWER/SLEEP lamp lights to indicate normal operation while the server is powered. When the server is off-powered, the POWER/SLEEP lamp stays unlit.

The POWER/SLEEP lamp indicates that the server is running in the power-saving mode (sleep mode). If the OS supports the power-saving mode such as Windows 2000, pressing the SLEEP switch blinks the POWER/SLEEP lamp in green and places the server in the power-saving mode. Press the POWER switch to turn out the POWER/SLEEP lamp and place the server back in the normal mode.

The power-saving mode is only available when the OS supports the power-saving feature. Some OS's allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode with a command.

DISK ACCESS Lamp ( )

The DISK ACCESS lamp indicates the state of hard disks in the 3.5-inch hard disk drive bay.

This lamp lights in green every time any of such hard disks is accessed.

When the DISK ACCESS lamp is lit in amber, it indicates that a hard disk error occurred. To identify a failed hard disk, see the lamps provided for each hard disk.

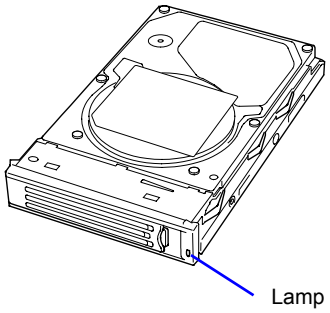
When the DISK ACCESS lamp lashes in green and amber by turns or in amber only, it indicates that hard disks connected to the internal disk array controller are in auto-rebuilding (reconfiguration).

Access Lamps

The access lamps for the floppy disk drive and the CD-ROM drive light when access is made to a media in the drive.

Hard Disk Drive Lamp

The disk lamp on the 3.5-inch hard disk drive bay has different meanings depending on the display status.



- Lighting green

  Indicates that the power is supplied to the hard disk.

- Blinking green

  Indicates that the hard disk is accessed.

- Lighting amber

  Indicates that the installed hard disk is defected in the disk array configuration.

  NOTE: While hard disks are in the disk array configuration (RAID1 or RAID5), a single failed hard disk does not affect the operation of the server. However, it is recommended to replace the failed hard disk and auto-rebuild (reconfigure) the hard disks as soon as possible. (You can hot-swap such a failed hard disk.)

- Alternate lighting green or amber

  Indicates that the hard disk is being rebuilt (this status is not a failure). If the defected hard disk is replaced with a new one in the disk array configuration, the data is automatically rebuilt (auto rebuild function). During the rebuild operation, the lamp is lit green or amber alternatively.

  The lamp goes off when the rebuild is terminated normally. The lamp goes on amber if the rebuild fails.

  IMPORTANT: To abort rebuilding, power off the server. In such a case, restart the server, hot-swap the failed hard disk, and restart rebuilding. Observe the following notes to use the auto-rebuild feature.

  - Do not power off the server. (If the server is powered off before rebuilding hard disks, the auto-rebuild feature will not start.)
  - When you removed a hard disk, wait at least 90 seconds before installing the hard disk back again.
  - Do not replace another hard disk while rebuilding is in progress.

Power Supply Lamps (hot-swap power supply model only)

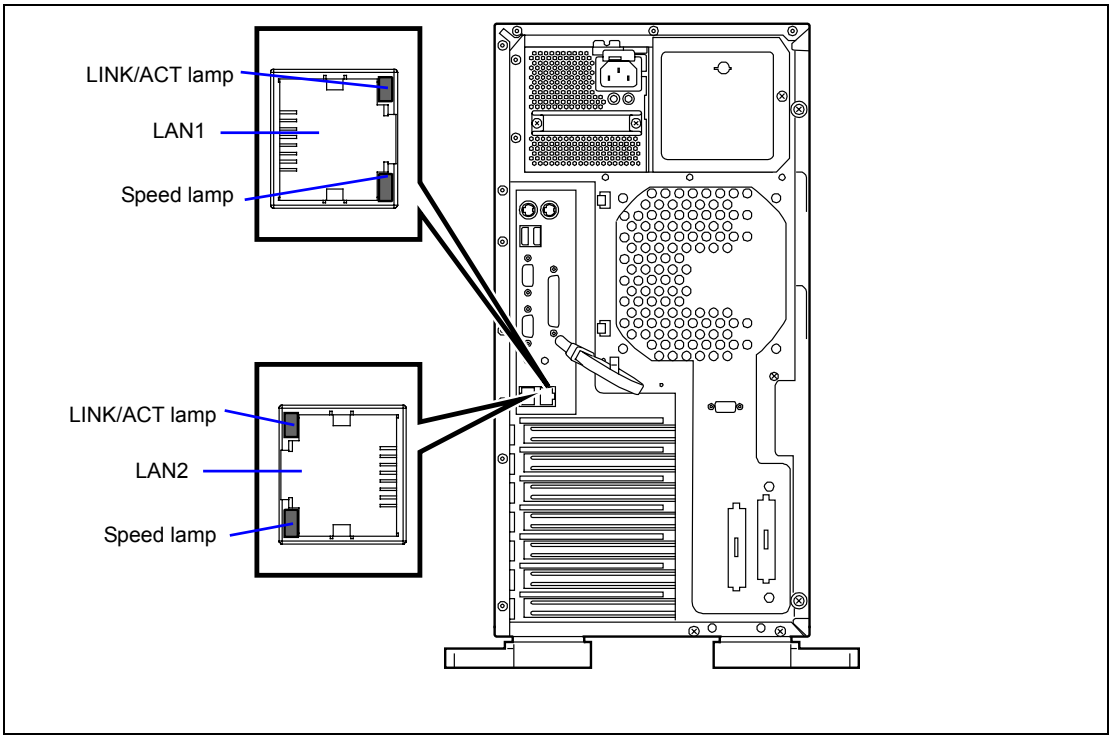
The power supply on the rear of the server has two lamps.

NOTE: The server equipped with an optional power unit can continue the operation with the normal power unit if the other power unit is defected (redundant function). The defected power unit can be replaced with a new one in the hot-swap mode without power interruption.

Power supply condition	Power Supply LEDs	
	LED #1 (Power) Green	LED #2 (FAIL) Amber
No AC power to all PSU	OFF	OFF
No AC power to this PSU only or power supply failure or current limit	OFF	ON
AC present / only standby output ON	Blink green	OFF
Power supply DC outputs ON and OK	Green	OFF

LAN Connector Lamps

Each of the two LAN connectors on the rear panel has two lamps as follows.



- LINK/ACT lamp

  The link/ACT lamp indicates the state of each network port normally equipped with the server. If the power is supplied to the server and the hub and they are correctly connected with each other, the lamp is lit green (LINK state). If information is transmitted through a network port, the lamp blinks green (ACT state).

  If the lamp is not lit in the LINK state, check the network cable and the cable connection. If the lamp is not lit still after the checking, the network (LAN) controller may be defected. Contact your service representative.

- 1000/100/10 lamp

  The 1000/100/10 lamp indicates whether each of the network ports normally equipped with the server is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface. If the lamp is lit amber, the network port is operated through 1000BASE-T. If the lamp is lit green, the network port is operated through 100BASE-TX. If the lamp is off, the network port is operated through 10BASE-T.

ERROR MESSAGES

If an error occurs in the server, an error message appears on the display unit connected to the server.

Error Messages after Power-on

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When the POST detects any error, it displays an error message and its measure on the display unit.

Follow the table below to troubleshoot such errors. However, even when there is no hardware failure, use of the keyboard or mouse at the following timing causes the POST to assume a keyboard controller error and stop processing.

- Immediately after the server is powered
- Immediately after the system is rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl** + **Alt** + **Delete**)
- Immediately after the system is rebooted in response to an OS instruction
- During hardware initialization following restart of the POST

When the POST detects a hardware failure due to the above reason, restart the server once again. If the same error message reappears, you may assume there is no hardware error. To ensure normal operation of the server, however, make sure to follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory count appears on the screen following the server power-on.
- Do not make any keyboard entry or use the mouse before the start-up message of the Configuration Utility appears on the screen following the server reboot.

> **IMPORTANT:** Take a note on the on-screen message before contacting your sales agent. The alarm indication would be a great help for maintenance.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. The following table lists error codes, error messages, and actions to take.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your sales agent. Alarm messages are useful information for maintenance.

Error code	Error message	Recommended Action
0200	Failure Fixed Disk.	Contact your service representative.
0210	Stuck Key.	Disconnect the keyboard and connect it again.
0213	Keyboard locked - Unlock key switch.	Release the lock of the key switch. If the error cannot be corrected in spite of the release of the lock, contact your service representative.
0220	Monitor type does not match CMOS - Run SETUP.	Start the SETUP. If the error cannot be corrected in spite of the start of SETUP, contact your service representative.
0230	System RAM Failed at offset.	Contact your service representative.
0231	Shadow Ram Failed at offset.	
0232	Extended RAM Failed at address line.	
0250	System battery is dead - Replace and run SETUP.	Contact your service representative to replace the battery. (After restarting the computer, start the SETUP to provide the setting again.)
0251	System CMOS checksum bad - Default configuration used.	The default values have just been set. Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
0252	Password checksum bad - Passwords cleared.	The password has just been cleared. Start the SETUP to provide the setting again.
0260	System timer error.	Start the SETUP to set the date and time again. If the same error occurs successively in spite of the resetting, contact your service representative.
0270	Real time clock error.	
0271	Check date and time setting.	
02B0	Diskette drive A error.	Start the SETUP to set the "Legacy Floppy A" in the Main menu again. If the same error occurs successively in spite of the resetting, contact your service representative.
02B2	Incorrect Drive A type - run SETUP.	Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
02D0	System cache error - Cache disabled.	The cache cannot be used. Contact your service representative.

Error code	Error message	Recommended Action
02D1	System Memory exceeds the CPU's caching limit.	Contact your service representative.
02F4	EISA CMOS not write able.	
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	
0B22	Processors are installed out of order.	Request the maintenance to replace the CPU.
0B28	Unsupported Processor detected on Processor 1.	Make sure that the server supports the CPU. If you are not sure, contact your service representative to request the maintenance.
0B29	Unsupported Processor detected on Processor 2.	
0B30	Rear fan Alarm occurred.	Contact your service representative to replace the fan.
0B31	Front fan Alarm occurred.	
0B32	Optional fan Alarm occurred.	
0B5F	Forced to use Processor with error	Because an error is detected in every CPU, the system is forcibly started. Contact your service representative.
0B60	DIMM group #1 has been disabled	Contact your service representative.
0B61	DIMM group #2 has been disabled	
0B62	DIMM group #3 has been disabled	
0B63	DIMM group #4 has been disabled	
0B70	The error occurred during temperature sensor reading.	Contact your service representative.
0B71	System Temperature out of the range.	Contact your service representative to replace the fan.
0B74	The error occurred during voltage sensor reading.	Contact your service representative.
0B75	System voltage out of the range.	
0B80	BMC Memory Test Failed.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B81	BMC Firmware Code Area CRC check failed.	
0B82	BMC core Hardware failure.	
0B83	BMC 1BF or 0BF check failed.	
0B8B	BMC progress check timeout.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B8C	BMC command access failed.	
0B8D	Could not redirect the console - BMC Busy -	
0B8E	Could not redirect the console - BMC Error -	
0B8F	Could not redirect the console - BMC Parameter Error -	
0B90	BMC Platform Information Area corrupted.	
0B91	BMC update firmware corrupted.	

Error code	Error message	Recommended Action
0B92	Internal Use Area of BMC FRU corrupted.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B93	BMC SDR Repository empty.	Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B94	IPMB signal lines do not respond.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B95	BMC FRU device failure.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B96	BMC SDR Repository failure.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B97	BMC SEL device failure.	
0B98	BMC RAM test error.	
0B99	BMC Fatal hardware error.	
0B9A	Management controller not responding.	Update the RMC firmware. If the error cannot be corrected, contact your service representative.
0B9B	Private I2C bus not responding.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	
0BB0	SMBIOS – SROM data read error.	Contact your service representative.
0BB1	SMBIOS – SROM data checksum bad.	
8100	Memory Error detected in DIMM group #1.	Contact your service representative to replace the DIMM in the relevant group.
8101	Memory Error detected in DIMM group #2.	
8102	Memory Error detected in DIMM group #3.	
8103	Memory Error detected in DIMM group #4.	
None	Expansion ROM not initialized – PCI Mass Storage Controller in slot n (n: slot number)	Disable initialization of the optional device expansion ROM by using the BIOS SETUP utility (see Chapter 4).
	H/W Configuration of BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC configuration manual !!	Use the NEC EXPRESSBUILDER to configure the optional remote management card (see Chapter 6).

Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-2-2-3 indicates 1 beep, pause, 2 beeps, pause, 2 beeps, pause, and 3 beeps notifying that the checksum error occurred on ROM.

Beep code	Description	Recommended action
1-2	Option ROM initialization error	1. Check if the optional add-in card is properly installed. 2. Run the BIOS SETUP utility to check the IRQ assignment. 3. Ask your service representative to replace the add-in card or mother board..
3-3	ROM checksum error	Replace the mother board.
1-2-2-3		
1-3-1-1	DRAM refresh test error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board.
1-3-1-3	Keyboard controller error	1. Check if the keyboard is properly connected. 2. Replace the mother board.
1-3-3-1	No memory or capacity check error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board..
1-3-4-1	DRAM address error	
1-3-4-3	DRAM test Low Byte error	
1-4-1-1	DRAM test High Byte error	
1-5-1-1*	CPU startup error	1. Check if the CPU is properly installed. 2. Remove the CPU once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed CPU.
1-5-2-1*	No CPU installed	
1-5-4-4*	Abnormal voltage	
2-1-2-3	BIOS ROM copyright test error	Replace the mother board.
2-2-3-1	Unexpected interrupt test error	

* Beeps only when the optional remote management card is installed in your system.

SOLVING PROBLEMS

When the server fails to operate as expected, see the following to find out your problem and follow the instruction given before asking for repair.

If the server still fails to operate successfully after solving your problem, take a note on the on-screen message and contact your sales agent.

Problems with NEC Express Server

No screen display appears with beep:

- ❑ Are DIMMs installed securely?
  - → Check whether DIMMs are connected to the mating connectors firmly.
  - → Check whether DIMMs of different specifications are installed in the specific bank. See Chapter 9 for the specifications of DIMMs.
  - → DIMMs must be populated in pairs and in the following order: #5 and #6, #1 and #2, #3 and #4, then #7 and #8.
  - → Installed DIMMs must be the same speed and must all be registered.
  - → Installed DIMMs starting from the one having largest memory.
  - → Take a note of beep code pattern, and take appropriate action according to the table listed earlier in "Beep Codes".

Fail to power on the server:

- ❑ Is the server is properly supplied with power?
  - → Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.
  - → Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.
  - → Make sure the power breaker for the connected power outlet is on.
  - → If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. See the manual that comes with the UPS for details.

    Power supply to the server may be linked with the connected UPS using the BIOS SETUP utility of the server.

    <Menu to check: [Server] - [AC-LINK]>
- ❑ Did you press the POWER switch?
  - → Press the POWER switch on the front of the server to turn of the power (the POWER/SLEEP lamp lights).

Fail to power off the server:

- ❑ Is the POWER switch enabled?

  → Restart the server and start the BIOS SETUP utility.

  <Menu to check: [Security] - [Power Switch Inhibit]>

- ❑ Is the server running in the Secure Mode?

  → The POWER switch is disabled in the Secure Mode. (Forced shutdown is also not available.) To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

POST fails to complete:

- ❑ Is the DIMM board installed?

  → At least two DIMM boards are required for operation.

  → DIMMs must be populated in pairs and in the following order: #5 and #6, #1 and #2, #3 and #4, then #7 and #8.

  → Installed DIMMs starting from the one having largest memory.

- ❑ Is the memory size large?

  → The memory check may take a few seconds if the memory size is large. Wait for a while.

- ❑ Did you perform any keyboard or mouse operation immediately after you started the server?

  → If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

- ❑ Does the server have contains appropriate memory boards or PCI devices?

  → Operation of the server with unauthorized devices is not guaranteed.

Fail to access to internal or external devices (or such devices fail to operate):

- ❑ Are cables properly connected?

  → Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.

- ❑ Is the power-on order correct?

  → When the server has any external devices connected, power on the external devices first, then the server.

- ❑ Did you install drivers for connected optional devices?

  → Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

- ❑ Is BIOS configuration correct?

  → When the server has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS SETUP utility of the server. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot n ROM]
  - n: PCI slot number>

  → Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menu to check: [Advanced] - [Peripheral Configuration]>

The POWER switch and sleep feature are disabled:

- ❑ Is the server in the Secure Mode?

  → In the Secure Mode, the POWER switch and sleep feature are disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

The keyboard or mouse fails to operate:

- ❑ Is the cable properly connected?

  → Make sure that the cable is connected to the correct connector on the rear of the server.

  → The keyboard or mouse does not operate if it is connected when the server is powered (not applicable to USB devices). Power of the server first and connect it properly.

- ❑ Is BIOS configuration correct?

  → The keyboard and mouse may be disabled with the BIOS SETUP utility of the server. Check the settings with the BIOS SETUP utility.

  <Menus to check: [Advanced] - [Numlock]>

- ❑ Are the server drivers installed?

  → Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

- ❑ Is the server in the Secure Mode?

  → In the Secure Mode, the keyboard and mouse are disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

Fail to access (read or write) to the floppy disk:

- ❑ Does the floppy disk drive contain a floppy disk?

  → Insert a floppy disk into the floppy disk drive until it clicks.

- ❑ Is the floppy disk write-protected?

  → Place the write-protect switch on the floppy disk to the "Write-enabled" position.

- ❑ Is the floppy disk formatted?

  → Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.

- ❑ Is BIOS configuration correct?

  → The floppy disk drive may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.

  <Menus to check:

  [Main] - [Floppy A]

  [Security] - [Diskette Write Protect]>

❑ Is the server in the Secure Mode?

→ In the Secure Mode, write access to the floppy disk may be disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

Fail to access to the CD-ROM:

❑ Is the CD-ROM properly set in the CD-ROM drive tray?

→ The tray is provided with a holder to secure the CD-ROM. Make sure that the CD-ROM is placed properly in the holder.

❑ Is the CD-ROM applicable to the server?

→ The CD-ROM for Macintosh is not available for use.

Inserted the correct CD-ROM but the message like the following is displayed:

```
The CD-ROM is not inserted or the wrong CD-ROM is inserted.
Please insert the correct CD-ROM.
OK
```

❑ Is the data side of the CD-ROM dirty or injured?

→ Take the CD-ROM out of the CD-ROM drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk:
(Refer to the documentation supplied with the disk array controller.)

❑ Is the hard disk applicable to the server?

→ Operation of any device that is not authorized by NEC is not guaranteed.

❑ Is the hard disk properly installed?

→ Make sure to lock the hard disk with the lever on its handle. The hard disk is not connected to the internal connector when it is not completely installed (see Chapter 9).

Fail to access the (internal or external) SCSI devices:

- ❑ Is the SCSI device applicable to the server?

  → Operation of any SCSI device that is not authorized by NEC is not guaranteed.

- ❑ Is the cable connection changed?

  → The SCSI connector on the motherboard in the server can be used for either built-in file devices or external SCSI devices. The connection to built-in or external devices can be switched by modifying cable connection properly. See Chapter 10.

- ❑ Are SCSI devices properly configured?

  → When the server has external SCSI devices connected, hard disk settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.

- ❑ Are the SCSI controllers (including optional controllers) properly configured?

  → Use the BIOS SETUP utility for proper configuration of SCSI devices connected to the SCSI connector on the mother board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the BIOS SETUP utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

Problems with Windows Server 2003

When network cable isn't connected with a port, the following log may be found in event log.
But this has no affect on the behavior of LAN driver.

Event ID:	6
Source:	E100B
Type:	Error
Description:	Hardware failure detected.
Machine:	Express5800/<Your Model Name>
Lan:	100BASE
Solution:	Connect a network cable in a port and then reboot the system or change the [Smart Power Down] value to "Off", the log will not be found in event log any more.

Problems with Windows 2000

Cannot install the operating system correctly.

- ❑ Did you confirm the notes on installing the operating system?

  → See Chapter 6.

During Windows 2000 installation, the following warning is registered in the System Log of the Event Viewer:

```
Error detected on the device \Device\CdRom0
during the paging operation.
```

→ There is no problem on this issue.

Fail to start the OS:

- ❑ Is a floppy disk in the floppy disk drive?

  → Take out the floppy disk and restart the server.

- ❑ Is the NEC EXPRESSBUILDER CD-ROM in the CD-ROM drive?

  → Take out the NEC EXPRESSBUILDER CD-ROM and restart the server.

- ❑ Is the OS broken?

  → Use recovery process to recover the system. (See "Recovery for Windows 2000 System" in this Chapter.)

The event log after every logon to Windows 2000 includes the following error log:

```
Description (D)
The CPUs in this multiprocessor system are not all the same revision level.
To use all processors the operating system restricts itself to the features of
the least capable processor in the system. Should problems occur with
this system, contact the CPU manufacture to see if this mix of processors
is supported.
```

- ❑ Has the CPU been expanded?

  → If the different revision (stepping) of the processor is installed in the multiprocessor system, Windows 2000 logs the above information every startup. If this message is logged, it is no problem for operation.

The OS presents unstable operation:

- ❑ Did you update the system?

  → Installing a network drive after installation of the OS may cause unstable operation. Use the NEC EXPRESSBUILDER CD-ROM to update the system. (See Chapter 6.)

The system does not restart automatically when a stop error occurs, though the system is adjusted to automatically restarting:

→ When the system does not restart automatically, restart it manually.

The system restarts automatically when a stop error occurs, though the system is NOT adjusted to automatically restarting:

→ There is no problem about this issue.
Check the System Event Log to confirm that STOP error occurred.

Cannot turn the power OFF at the blue screen:

→ If you want to turn off the power at the blue screen, execute forced shutdown (forced shutdown: continue to press POWER switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

The server is not found on the network:

- ❑ Is the LAN cable connected?

  → Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure that the LAN cable to use conforms to the network interface standard.

- ❑ Is BIOS configuration correct?

  → The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.

  <Menus to check:

  [Advanced] - [PCI Configuration] - [Embedded NIC (Dual Gbit)]>

- ❑ Have the protocol and service already configured?

  → Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

- ❑ Is the transfer speed correct?

  → Open the network property dialog box in control panel to specify the "Link Speed & Duplex" value the same as the value specified for HUB.

Problems with NEC EXPRESSBUILDER

When the server is not booted from the NEC EXPRESSBUILDER CD-ROM, check the following:

- ❑ Did you set the NEC EXPRESSBUILDER during POST and restart the server?

  → If you do not set the NEC EXPRESSBUILDER during POST and restart the server, an error message will appear or the OS will boot.

- ❑ Is BIOS configuration correct?

  → The boot device order may be specified with the BIOS SETUP utility of the server. Use the BIOS SETUP utility to change the boot device order to boot the system from the CD-ROM drive first.

  <Menu to check: [Boot]>

- ❑ Is an error message appeared?

  → When an error occurs while the NEC EXPRESSBUILDER is in progress, the following message appears. After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

Message	Cause and Remedy
This machine is not supported.	This NEC EXPRESSBUILDER version is not designed for this server. Execute the NEC EXPRESSBUILDER on the compliant server.
NvRAM access error	An access to the nonvolatile memory (NvRAM) is not acceptable.
Hard disk access error	The hard disk is not connected or it is failed. Check whether the hard disk is correctly connected.
The system-specific information does not exist on the baseboard. Please restore the backup data or write the data by using [System Information Management] of the Off-line Maintenance Utility. Only the authorized personnel are allowed to do this operation.	The system-specific information can't be acquired in the mother board exchange and so on.

Problems with Express Setup

Following message appeared when you tried to install Express Setup to the hard disk that has smaller capacity than the specified partition size:

The specified partition size has exceeded the capacity of the hard disk. The setup created the partition at the maximum size that can be reserved on the hard disk. Setup will continue the process. OK

→ It is not an abnormal condition. Press **Enter** to continue the installation.

The message can not be displayed correctly when copying the files from CD-ROM or checking CD-ROM:

→ Press **R**. When the message appears again even if you press **R**, restart the Express Setup from the beginning. In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the CD-ROM drive.

Express Setup terminated and asks to input setup information.

→ There are some errors on the specified setup information.
Follow the instruction to input the correct value. It is not necessary to cancel the installation. On Windows 2000, you might be asked to press Enter again after the last reboot of the setup.

[Complete] appears on the [Role of Computer] screen.

→ If you click [Complete] here, the setup will select the default value of Express Setup for the later specification to continue the process.

<The Default Value for Windows 2000>

The specification of network protocol

Protocol :	TCP/IP[DHCP Specified]
Service :	Select sharing Microsoft network files and printer.
Client :	Microsoft network client.
Component :	SNMP, IIS (Excluding Professional)
Application :	NEC ESMPRO Agent
	Power Console Plus
	(if optional RAID controller is installed in the system)

[Complete] does not appear on [Role of Computer] screen.

→ The [Complete] does not appear if the Setup File that has already been created is loaded.

→ [Complete] appears only when you first entered the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], the [Complete] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.

Select [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.

→ Is there any other partition than the partition to re-use (excluding maintenance area)? If the partition other than the one to re-use does not exist, the setup will reserve the whole area of the disk to install Windows 2000.

Specified to join the Domain, but the system is installed as Workgroup.

→ When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

Specified large value as partition size, but when Windows 2000 is actually started, the system partition is created by 4095MB.

→ Is the [Partition Size] specified by the value larger than the real area? If you want to create one partition in all area of the hard disk(excluding the maintenance area) to install the OS, specify [All Area].

→ Are you specifying over 200GB for the partition size?

Be sure to specify less than 200GB for the partition size.

Windows 2000 started with different display resolution from the specified value.

→ If the specified display resolution can not be used, the system will use the nearest value or the default value of the driver.

Entered the incorrect Product ID/CD key.

→ Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value. Also in this case, input request will occur when rebooting after GUI setup completed during Express Setup. If these 2 inputs are done correctly, there is no problem on Windows 2000 setup.

The following message appears on the screen and the setup is suspended while the Express Setup is executing:

```
Bad Command or filename
Insufficient disk space
```

→ Follow the procedure described below and check the BIOS settings for the SCSI controller.
As for the procedure on the SCSI controller which is not described in this User's Guide, refer to the manual accompanied with the controller and check the setting for "Int13 Extensions".

<In case the SCSI Controller is AIC-7892>

1. Press **Ctrl** + **A** when POST displays "AIC-7892".
2. Select "Configure/View Host Adapter Settings".
3. Select "Advanced Configuration Options" and press **Enter**.
4. Change the setting of "BIOS Support for Int13 Extensions" to "Enabled".
5. Exit from BIOS setup menu and restart the system.
6. Start the Express Setup.

Unable to specify the details of Network adapter.

→ In Express Setup, you can not specify the details of Network adapter. Specify them from Control Panel after starting Windows 2000.

Windows 2000 is started with Network adapter that has not been specified during Express Setup

→ Windows 2000 will install the recognized Network adapter specified as default value. If you want to modify the specification, it can be done from Control Panel after starting Windows 2000. Also, the Network adapter that has been specified during Express Setup but that is not connected will not be setup, though the protocol will only be installed.

Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.

→ It's a design. Each adapter is specified so that all the installed protocols can be used. The value that can not be specified during Express Setup will all be specified by default value.

When more than two Network adapter are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.

→ When more than two Network adapter are specified, the detailed specification of the protocol may all be set by default value. Re-specify the details from Control Panel.

Not more than two Network adapter is connected, but the detailed specification of the protocol are all set by default.(e.g. Specified IP Address on TCP/IP, but DHCP is specified)

→ Are you specifying more than two protocols?
In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default.
Re-specify the details from Control Panel after starting the OS.

The following error log is included in the event log while operating the system:

<Windows 2000>

Event ID: 16

Source: iANSMiniport

Type: Error

Category: None

Description: Team #0: The last adapter has lost link.
Network connection has been lost.

Event ID: 11

Source: iANSMiniport

Type: Warning

Category: None

Description: Adapter link down: Intel(R) 82546EB Based Dual Port Network Connect...

→ Though the above error is included in the event log when specifying the teaming, the LAN driver can work properly.

Error Message during Disk Array Configuration

When an error is detected during the automatic Disk Array Configuration of the Easy Setup process, any of the following messages appears.

- An illegal device status exists in the status table.
- An illegal status is returned during the Configuration Data read.
- Configured device(s) is not responded.
- The configuration in NvRAM does not agree with the configuration in EEPROM.
- The number of pack configuring disks is 0 or 9 or above.
- An error occurs during the configuration table read.
- The configuration table in NvRAM cannot be read.
- An illegal RAID level exists in the configuration table.
- An error occurs during the CONFIG2 table transfer.
- The adapter is not responded.
- A CONFIG2 checksum error occurred.
- Adapter is not exists.

When one of above messages is observed, the Disk Array controller or the hard disk drive may be failed. Check that cable connections and switch settings are correct, and then attempt to run NEC EXPRESSBUILDER once again.

Problems with Master Control Menu

The master control menu fails to appear:

❑ Is your system Windows NT 4.0 or later, or Windows 95 or later?

→ The menu is only able to run on Windows NT 4.0 (or later) or Windows 95 (or later).

❑ Is **Shift** pressed?

→ Setting the CD-ROM with **Shift** pressed down cancels the Autorun feature.

❑ Is the system in the proper state?

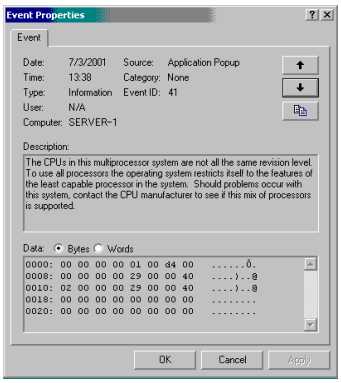
→ The menu may not appear depending on the system registry setting or the timing to set the CD-ROM. In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

Collecting Event Log

This section describes on how to collect the log of various events that occurred on the server.

IMPORTANT: If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

NOTE: The different revision processor may be mixed in additional CPU kit. When Windows 2000 is used, following message may be appeared in the System Log of the Event Viewer after extension the different revision of two or more CPUs in the NEC Express server. If this message is logged, it is no problem for operation.


Event Properties
Event
Date: 7/3/2001 Source: Application Popup
Time: 13:38 Category: None
Type: Information Event ID: 41
User: N/A
Computer: SERVER-1
Description:
The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacturer to see if this mix of processors is supported.
Data: Bytes Words
0000: 00 00 00 00 01 00 d4 00 .....Ô.
0008: 00 00 00 00 29 00 00 40 ....)..@
0010: 02 00 00 00 29 00 00 40 ....)..@
0018: 00 00 00 00 00 00 00 00 ....
0020: 00 00 00 00 00 00 00 00 ....
OK
Cancel
Apply

1. Click [Management Tool] → [Event Viewer] from the Control Panel.
2. Select the type of the log to collect.

   On [Application Log], the events related to the running application is archived. On [Security Log], the events related to the security is archived. On [System Log], the events occurred at the item which configures Windows 2000 system is archived.
3. Click [Save as...] in the [Run] menu.
4. Input the file name of archived log in the [File Name] box.
5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows Online Help.

Collect Configuration Information

This section describes on how to collect the information on hardware configuration and inside specification.

In order to collect information, "Diagnostic Program" is used.

> **IMPORTANT:** If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

<For Windows Server 2003>

Refer to Windows online help.

<For Windows 2000>

1. Point to [Settings] in Start menu, and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Management Tool], and double-click [Computer Management].

   The [Computer Management] dialog box appears.

3. Click [System Tool] → [System Information].
4. Click [Save as System Information File] in the [Operation] menu.
5. Input the file name to save in the [File Name] box.
6. Click [Save].

Collecting Dr. Watson Diagnostic Information

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified as you like. For more information, refer to Chapter 5.

Memory Dump

If an error occurs, the dump file should be saved to acquire necessary information.

If you saved the dump to DAT, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information as you like.. For more information, refer to "Specifying Memory Dump (Debug Information (refer to Chapter 5 for detail)".

IMPORTANT:

- Consult with your sales agent before dumping the memory. Dumping the memory while the server is in the successful operation may affect the system operation.
- Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in dumping improper data.

Preparing for Memory Dumping

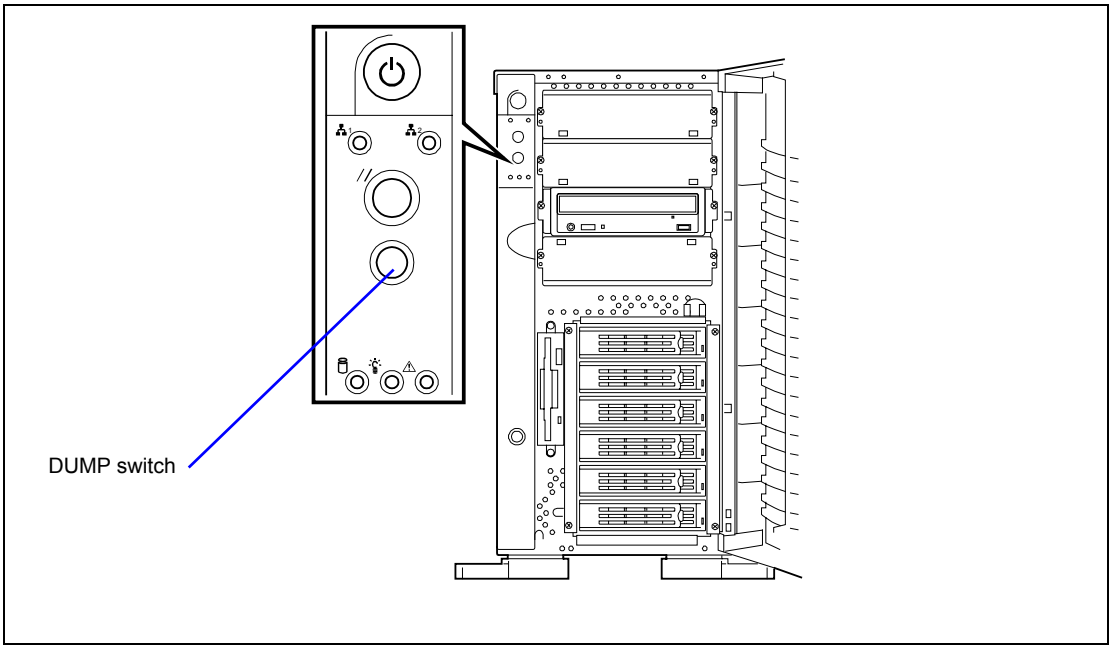
Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this setting disables POWER switch operation.

Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

1. Power on the server and start the BIOS setup utility, SETUP.
2. Select "Disable" for "Power Switch Inhibit" in the Security menu.
3. Save the configuration data and exit the SETUP.

Saving the Dump File

Press the DUMP switch to save the dump file when an error occurs. Insert a metal pin (a straightened large paper clip will make a substitute) into the switch hole to press the DUMP switch.



Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

RECOVERY FOR Windows 2000 SYSTEM

If any file necessary for running the OS is damaged, use the following procedures to recover the system.

IMPORTANT:

- After recovering the system, see "Updating the System" in Chapter 5 and be sure to update the system.
  Also on Windows 2000, you need to update all the drivers after the system update. For more information, see "Installing and Setting Device Drivers" in Chapter 5.
- If the hard disk can not be recognized, you can not recover the system.

Follow the procedure below and use the information in the disk, not system recovery disk, to recover the system.

1. Turn on the power of the system.
2. Insert Windows 2000 CD- ROM into the CD-ROM drive of your server.
3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)
4. Press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed at the upper part of the screen.

   NOTE: Nothing is changed on the screen through **F6** is pressed.

5. Press **S** when the following message appears:

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   Select [Other] and press **Enter**.

6. Insert Windows 2000 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive and press **Enter**.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   * Press ENTER when ready.
   ```

   Select the [Adaptec Ultra320 SCSI Cards (Win2000)] and press **Enter**.
   Then, it returns to the screen of Procedure 5.

7. If the optional board or SCSI HostRAID is installed, select the proper SCSI Adapter and press **Enter**.
   - Adaptec HostRAID U320 Driver Ver 1.02 For Windows 2000/XP/2003 (When SCSI HostRAID is installed.)
   - INITIO INI-A10XU2W SCSI Host Adapter (When N8103-65F board is installed.)
   - MegaRAID SCSI 320-1 Controller Driver (When N8103-80F board is installed.)
   - MegaRAID SCSI 320-2 Controller Driver (When N8103-81F board is installed.)
   - Adaptec I2O RAID Driver Disk for 32bit Windows 2000/XP/2003 (When N8103-86F board is installed.)
8. Press **R** to select the recovery option.
9. Select the keyboard.
10. If you are requested, press **R** to select system recovery procedure.
11. If you are requested, select either of the procedure below:

    [Manual Recovery] (Press **M**)

    Do not select this option unless you are a high-level user or a system administrator. If you use this option, you can recover the problems of system files, partition boot sector, and start-up environment.

    [Quick Recovery] (Press **F**)

    This option is very easy to use and the user does not need to do anything during the procedure. If you select this option, the system recovery disk program starts to recover the problems concerning system files, partition boot sector of system disk, and start-up environment (if multiple operating systems are installed on the system).
12. Follow the instruction displayed on the screen, and then press **L** at the screen which request you to insert system recovery disk. The system will be restarted once.

    NOTE: Starts the procedure without system recovery disk.

13. Repeat steps 1 to 10.

    The recovery procedure will be started.

    During the recovery, the missing files and the damaged files are replaced either to the files in C:\ I386 folder of hard disk or the files in systemroot\ Repair of the system partition. These replaced files do not reflect the changes of the configuration after the setup at all.
14. Follow the instruction displayed on the screen.

    If you take a note of any file name in which trouble is detected during the procedure, it is useful to diagnose how the system has been damaged.
15. Terminates the procedure if the recovery is successful.

    You can verify that the replaced files are correctly copied to the hard disk if the computer is restarted normally.

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent NEC ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.

IMPORTANT:

- The Off-line Maintenance Utility is intended for use of your sales agent. The NEC EXPRESSBUILDER CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your sales agent and follow instructions.
- Starting the Off-line Maintenance Utility disables any access from a client to the server.

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in the following ways.

- From the CD-ROM

  Set the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.

  After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

  The Off-line Maintenance Utility program starts from the CD-ROM.

- From the floppy disk

  Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

  The Off-line Maintenance Utility program starts from the boot disk.

  The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the NEC EXPRESSBUILDER.

- Manual start (by pressing **F4**)

  When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen. The Off-line Maintenance Utility starts from the hard disk.

Features of Off-line Maintenance Utility

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

> **IMPORTANT:** See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your sales agent.

- IPMI Information Viewer*

  Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them. Using this feature, you can find system errors and events to determine a maintenance part.

- BIOS Setup Viewer

  Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

- System Information Viewer

  Provides the functions to view information on the processor and the BIOS and export it to a text file.

- System Information Management

  Provides the function to make a back-up copy of your data.

  Without the backup data, the system-specific information and/or configuration may not be restored.

  Only the authorized personnel is allowed to restore the backup data.

- Start of Utilities

  With the NEC EXPRESSBUILDER, you can start the following utilities installed in the maintenance partition.

  – System Management*

  – System Diagnostics

  – Maintenance Partition Update

  * Available only when the optional remote management card is installed.

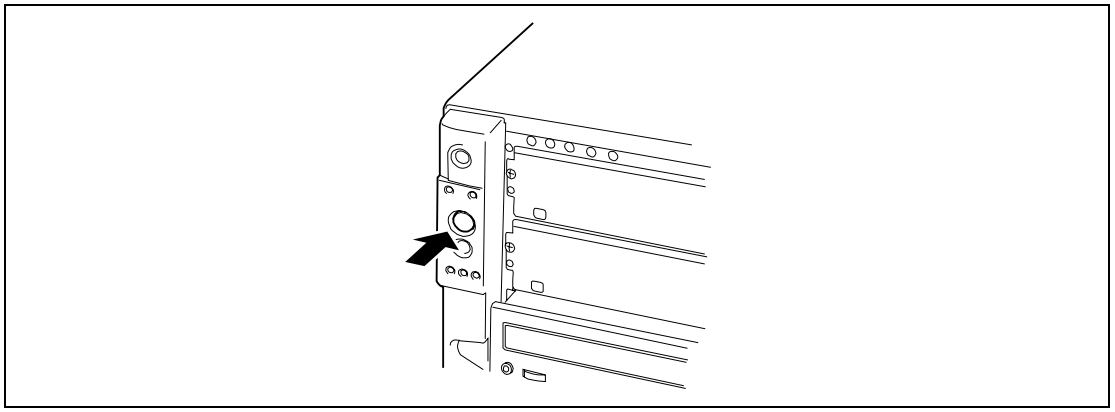
RESETTING THE SERVER

There are two ways to reset the server.

IMPORTANT: Resetting the server clears the DIMM memory and the data in process. To reset the server when it is not frozen, make sure that no processing is in progress.

- Hard reset

  Press the RESET switch at the front of the server.



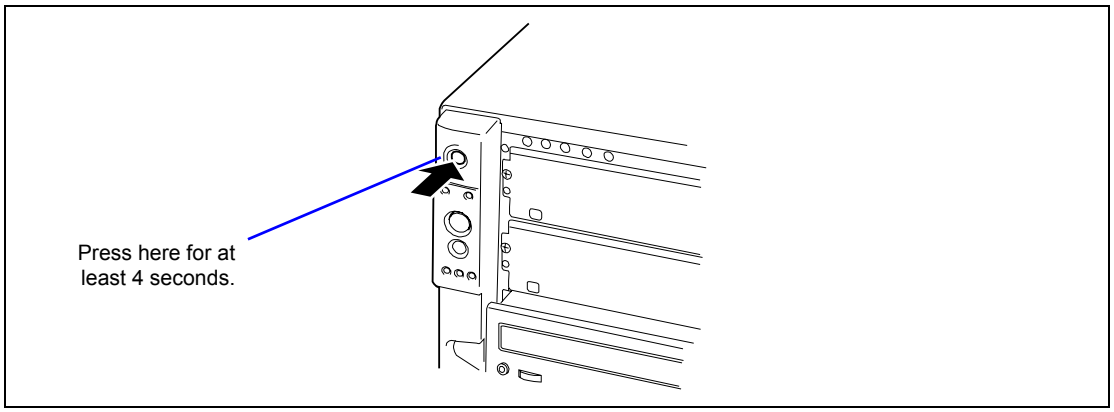
- Soft reset

  If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

FORCED SHUTDOWN

Use this function when an OS command does not shut down the server, the POWER switch does not turn off the server, or resetting does not work.

Press and hold the POWER switch on the server for at least four seconds. The power is forcibly turned off. To turn on the power back again, wait approximately 10 seconds after turning off the power (forced shutdown).



IMPORTANT: If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

Chapter 9

Upgrading Your Server

This chapter describes internal optional devices available for the server, procedures for install or removing such optional devices, and notes on using them.

IMPORTANT:

- You may conduct the installation and removal procedures described in this section by yourself. However, NEC is not responsible for any machine or component defects or bad influences resulting from the operation of the server subject to the installation or removal. NEC recommends that you request a maintenance engineer of your service representative having the expert knowledge on the server to do the installation and removal procedures.
- Use the options and cables approved by NEC. You will be charged by any repair of a malfunction, fault, or defect occurring in a server in which one or more component not approved by NEC are used.
- Always update the system if the hardware configuration is changed (See Chapter 5 for details).

SAFETY NOTES

Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- High temperature
- Make sure to complete board installation.
- Protect the unused connectors with the protective cap.

STATIC PRECAUTIONS

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. Electronic device can be easily damaged by static electricity. To prevent damage, observe the following information.

- Wear a wrist strap (an arm belt or anti-static glove).

  Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Touch a metal part regularly when working with components to discharge static electricity.

- Select a suitable work space.
  - Work with the server on the anti-static or concrete floor.
  - When you work with the server on a carpet where static electricity is likely to be generated, make sure take anti-static measures beforehand.
- Use a work table.

  Place the server on an anti-static mat to work with it.

- Clothe
  - Do not wear a wool or synthetic cloth to work with the server.
  - Wear anti-static shoes to work with the server.
  - Take off any jewels (a ring, bracelet, or wrist watch) before working with the server.
- Handling of components
  - Keep any component in an anti-static bag until you actually install it to the server.
  - Hold a component by its edge to avoid touching any terminals or components.
  - To store or carry any component, place it in an anti-static bag.

CONFIRMATION AFTER INSTALLATION/REMOVAL

Confirm the following after installing an additional option and removing a component:

- Installing removed components exactly as they were

  Install the components and cables, which were removed and disconnected for addition of an option, exactly as they were. Assembling without a component being installed or a cable being disconnected causes the server to malfunction.

- Confirming that no parts such as screws are left in the server

  Confirm that particularly conductive parts such as screws are not left in the server. Turning on the power with a conductive part on the mother board or cable terminal causes the server to malfunction.

- Confirming the cooling effect in the server

  Confirm that the ventilating holes are not covered with an internally connected cable. Insufficient cooling effect raises the internal temperature, which causes the server to malfunction.

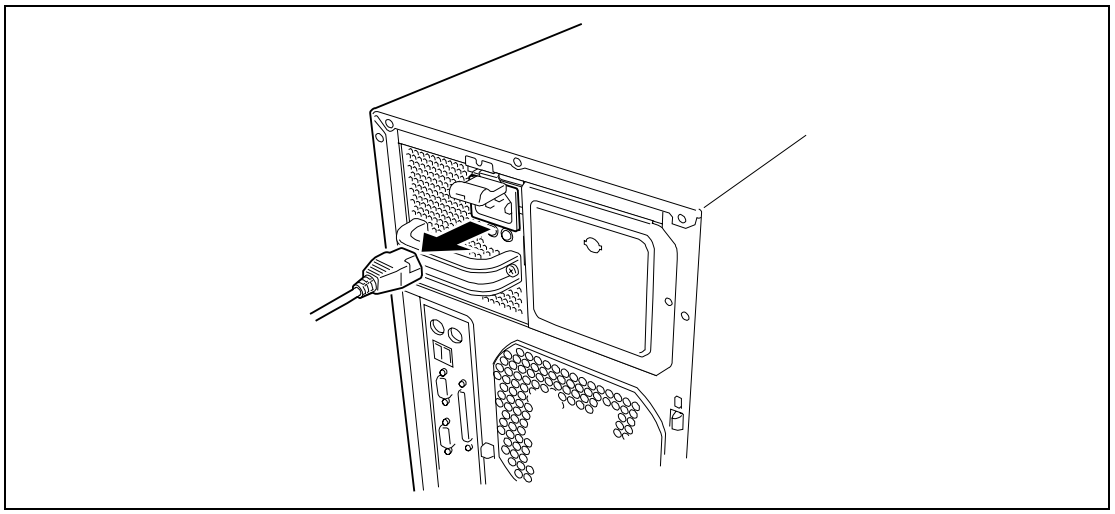
- Confirming operation with a tool

  Some additional devices require the diagnostic utility or BIOS SETUP utility to check if they are installed correctly. For details, see the procedure for additionally installing the target device.

PREPARING FOR INSTALLATION AND REMOVAL

Prepare the installation or removal of a component depending on the following procedure:

1. Shut down the OS.
2. Press the POWER switch to turn off the power of the server. (The POWER/SLEEP lamp goes off.)
3. Pull out all the power cords from the AC inlet on the server.



4. Remove all the cables connected to the server on the rear panel.
5. Make the clearance of 1 m to 2 m in the front and rear sides and left and right sides of the server.

DEVICE INSTALLATION OR REMOVAL PROCEDURE

Install or remove a component from the server in the following procedure.

Side Cover

The left side cover should be removed to access to built-in devices and/or mother board in the server. It is not necessary to remove the right side cover.

Removal

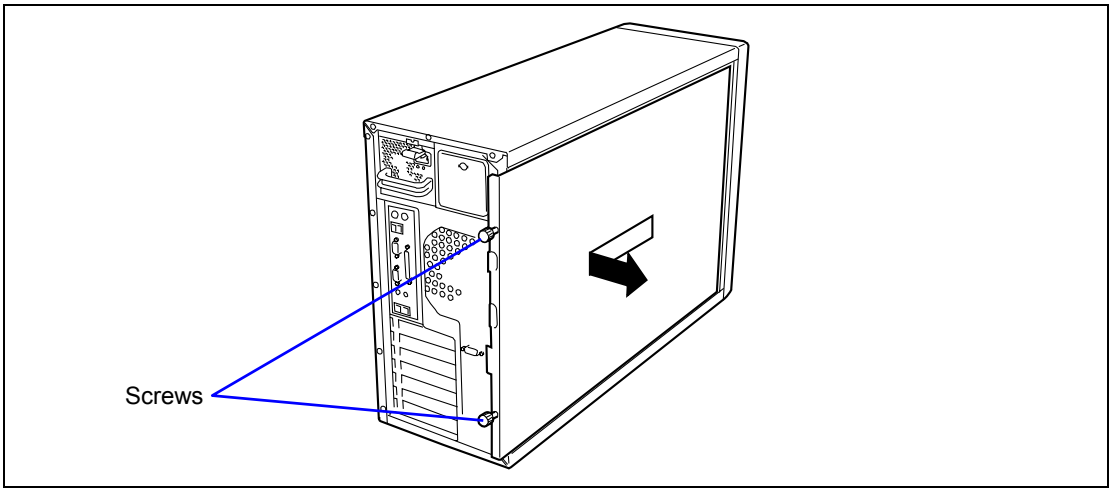
Remove the left side cover in the following procedure.

WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Disconnect the power plug before working with the server.

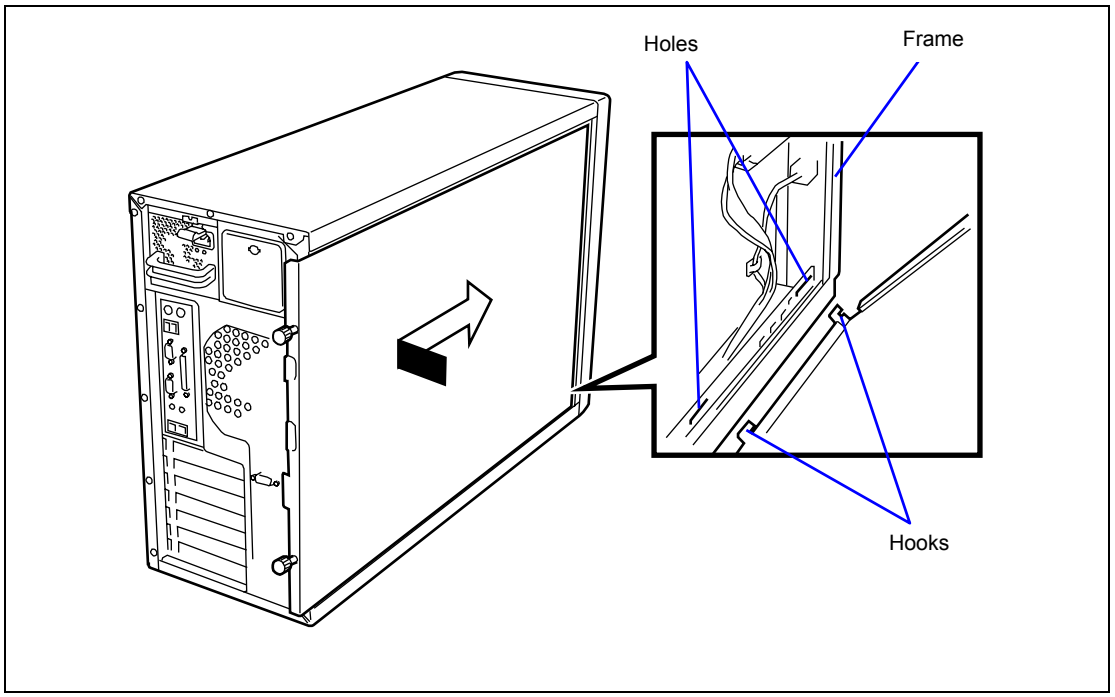
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Loosen the two screws.
3. Slide the cover backward a little.
4. Hold the side cover securely to remove it.



Installation

The side cover can be installed in the reverse procedure of the removal. Make sure that the hooks on the side cover are inserted into the frames and holes of the server securely.

IMPORTANT: After one or more optional devices are installed or removed completely, install the removed side cover securely. The installation of the left side cover is monitored by a cover sensor.



Processor Air Duct

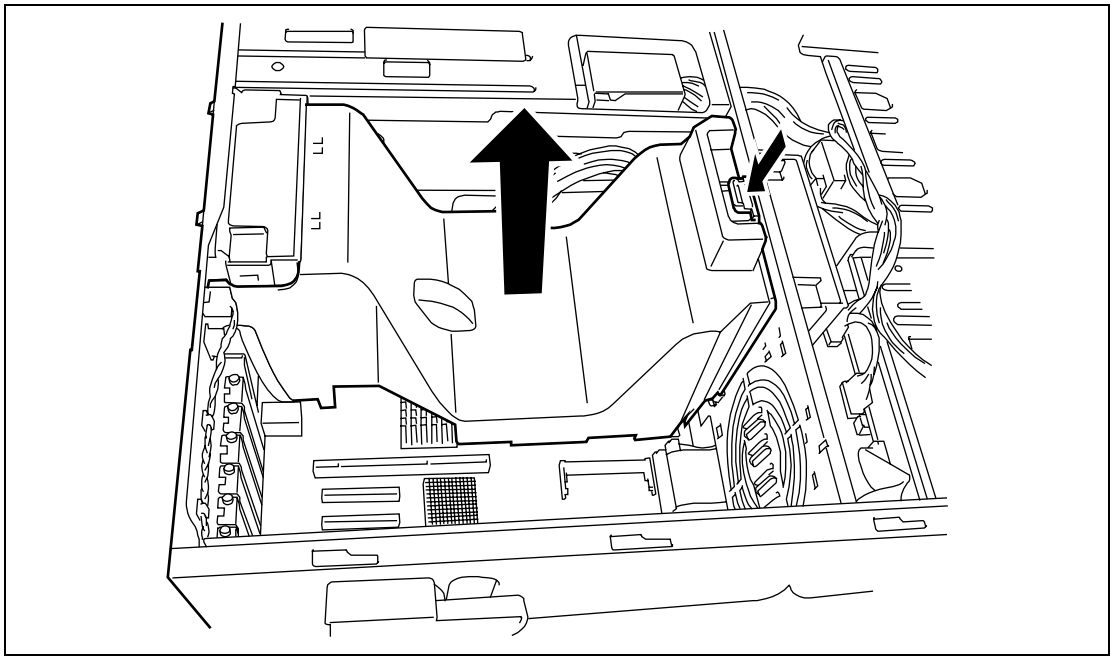
To install or remove the DIMM or processor, you will need to remove the air duct.

> **IMPORTANT:** Do not assemble the server without installing the air duct. No duct installed in the system reduces cooling efficiency and can affect performance or cause damage due to overheating.

Removal

Follow these steps to remove the air duct.

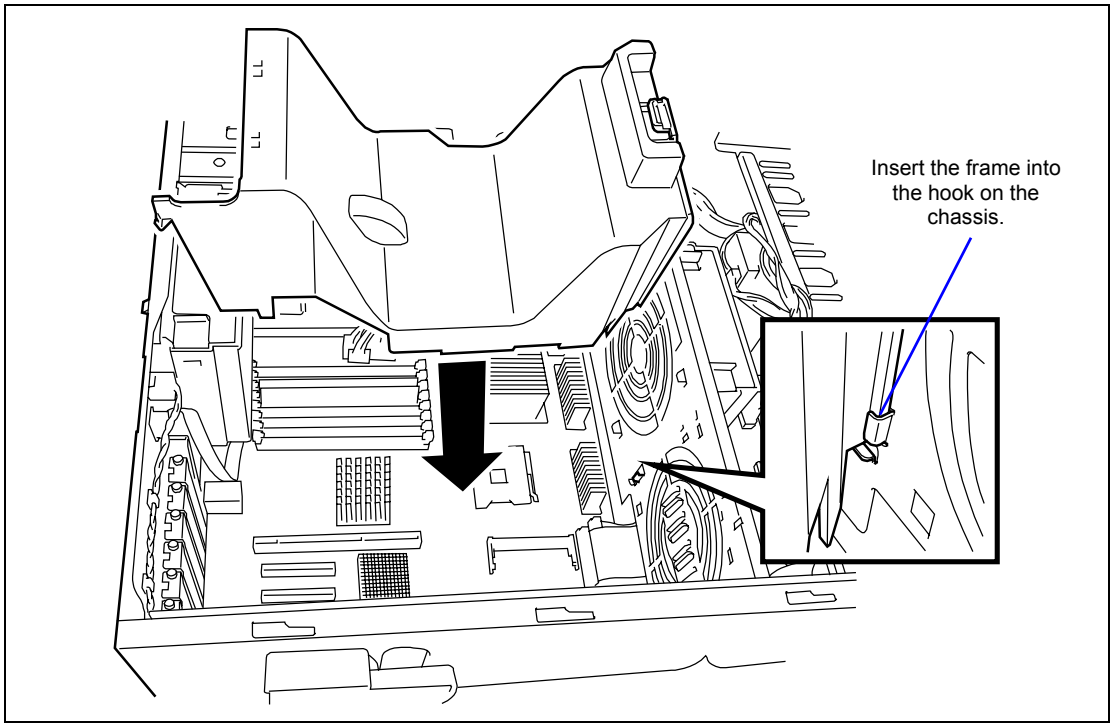
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Position the server unit on its right side.
3. Remove the side cover.
4. Hold the left side of the air duct, and push the right end of the tab to release from the chassis.
5. Remove the duct from the chassis.



Installation

Follow these steps to install the air duct.

1. Holding the internal cables clear, place the air duct into the chassis.
2. Adjust the air duct until the tab on the right end of the duct is aligned with the slot on the chassis.



3. Reinstall the side cover.

3.5-inch Hard Disk

The 3.5-inch hard disk drive bay on the front of the server contains six slots on which hard disks can be installed. The drive bay is not equipped with any hard disks (excluding when one or more built-in hard disks are ordered). Purchase the hard disks additionally if required.

IMPORTANT:

- Do not use any hard disks not approved by NEC. If an unapproved third party's hard disk is installed in the server, not only the hard disk but also the server itself may be defected. Purchase hard disks of the following models:
  - N8150-162F (36.3GB, 10,000 rpm, Ultra320)
  - N8150-163F (73.2GB, 10,000 rpm, Ultra320)
  - N8150-171F (146GB, 10,000 rpm, Ultra320)
  - N8150-165F (36.3GB, 15,000 rpm, Ultra320)
  - N8150-172F (73.2GB, 15,000 rpm, Ultra320)
- For the disk array configuration, refer to the manual that comes with the disk array controller.

A hard disk having the thickness of 1 inch can be installed on each of the slots. The SCSI IDs of the slots are fixed to ID0 to ID5 from bottom to top.

In the configuration at the shipment, the cable on the 3.5-inch hard disk drive bay is connected to the Ultra320 SCSI (A) connector on the mother board.

To provide the disk array configuration, connect the cable on the 3.5-inch hard disk drive bay to the disk array controller. The SCSI standard of the hard disk to be added should be the same as that of the existing disks.

A dummy tray is installed in an empty slot of the 3.5-inch hard disk drive bay. This is intended to improve the cooling effect within the server. Always install a dummy tray in any slot in which a hard disk is not installed.

IMPORTANT: A specified dummy tray must be used.

Installation

If installing new drives, follow an installation scheme starting with the bottom-most drive.

Fill the bays bottom-to-top.

Install a hard disk in the following procedure. A hard disk may be installed in any other slot in the similar procedure.

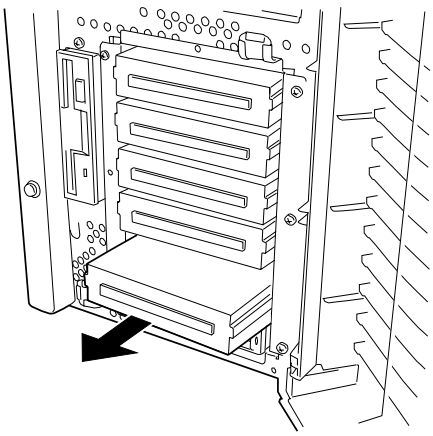
> **NOTE:** Hard disks can be installed or removed from the server only by opening the front door. In the disk array configuration, hard disks may be installed or removed with the power of the server being on.

> **IMPORTANT:** In the disk array configuration, hard disks configuring a specific pack should have the same specification including the capacity.

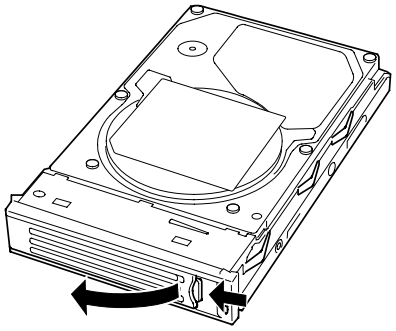
1. See the section "Preparing for Installation and Removal" described earlier to prepare (in other than the disk array configuration).
2. Release the lock of the front door by using the security key to open the front door.
3. Check the slot in which the hard disk is installed.

   There are six slots. The SCSI IDs are defined depending on the locations of the slots (SCSI ID0 to SCSI ID5 from bottom to top).
4. Remove the dummy tray.

> **IMPORTANT:**
>
> - Keep the dummy tray carefully.
> - To maintain the cooling effect in the server, install the dummy tray in the vacant slot of the disk bay.



5. Unlock the lever of the hard disk drive carrier and open the handle.

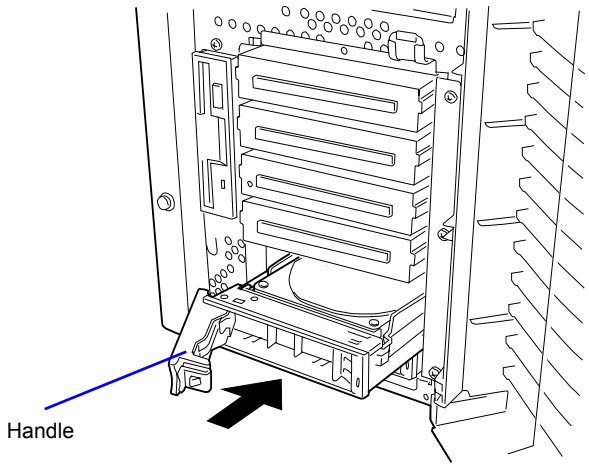


6. Align the drive carrier with the bay guide rail.

7. Slide the drive carrier into the bay until if docks with the SCSI backplane connector.

IMPORTANT:

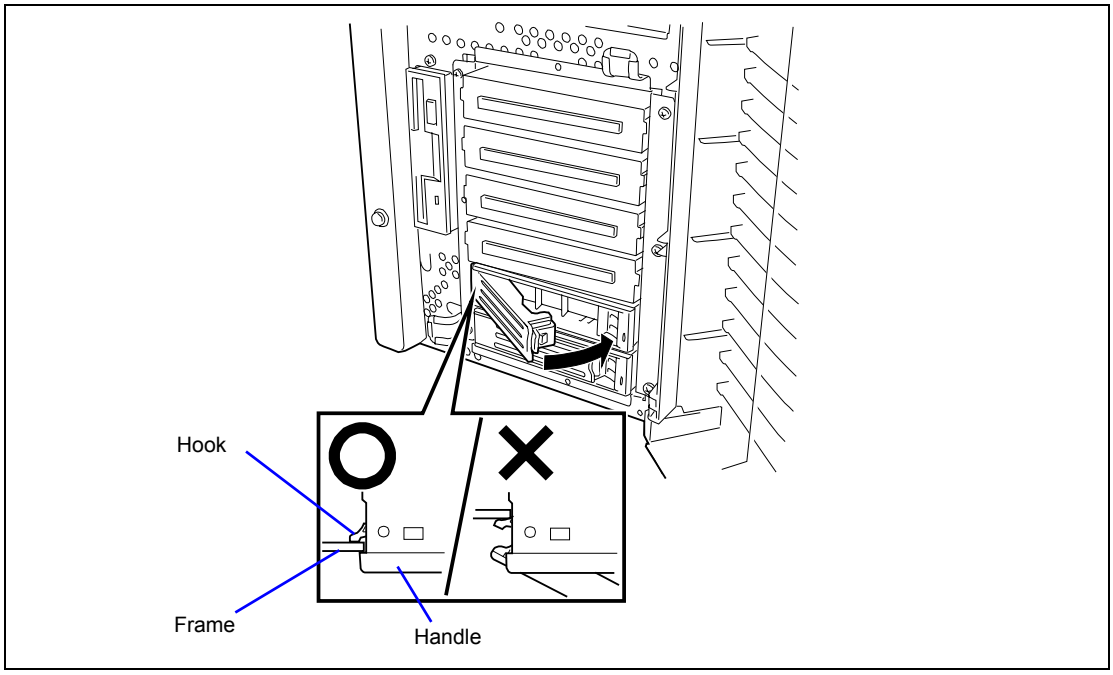
- Push the hard disk drive carrier until the hook of the handle hits the frame.
- Hold the hard disk drive carrier with both hands securely and carefully.



8. Close the lever ensuring it is secured. The handle is locked with a click.

IMPORTANT: Note that your fingers may not be caught between the handle and the tray.

NOTE: Make sure that the hook of the handle is hanged on the frame.



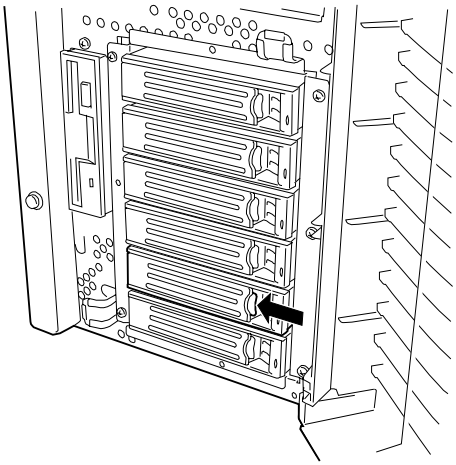
9. Close the door opened in step 2.

Removal

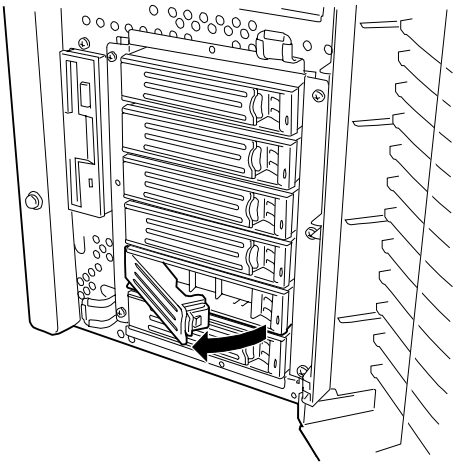
Remove the hard disk in the following procedure.

> **NOTE:** To remove a defected hard disk, first check the slot on which the disk lamp of the hard disk is lit amber.

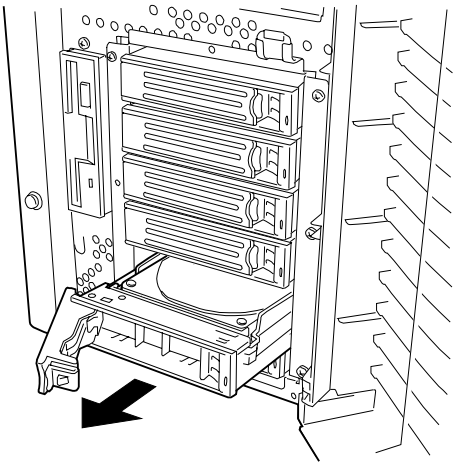
1. See the section "Preparing for Installation and Removal" described earlier to prepare (in other than the disk array configuration).
2. Release the lock of the front door by using the security key to open the front door.
3. Press the locking tab to release the lock.



4. Grasp the drive carrier handle and pull the handle toward you to disengage the drive connector from the backplane.



5. Hold the drive carrier handle and hard disk securely and remove the hard disk from the drive bay.



6. To use the server with the hard disk removed, insert a dummy tray into the empty slot.

> **IMPORTANT:** To maintain the cooling effect in the server, install the dummy tray in the vacant slot of the disk bay.

7. Close the door opened in step 2 securely.

In the disk array configuration, the auto rebuild function can be used. The auto rebuild function can record the information saved in a defected hard disk into the new replaced disk to recover the server to the state before the occurrence of the fault.

The auto rebuild function is valid for disk arrays set to RAID1 or RAID5.

The auto rebuild is automatically started only by the hot-swap of a defected hard disk (or disk replacement in the power-on state). During the auto rebuild, the disk lamp on the hard disk is lit green or amber alternatively.

IMPORTANT:

- If the auto rebuild fails, the disk lamp on the hard disk goes on amber. Provide the disk removal or installation again to run the auto rebuild.
- If the disk array monitoring utility is installed, the following display or operation may occur. However, the auto rebuild is conducted correctly if the disk lamp of the hard disk subject to the auto rebuild is not lit amber after the termination of the auto rebuild.
  - Message "Rebuild was canceled" appears on the screen during the auto rebuild.
  - It seems that the auto rebuild is terminated once and then restarted.

Obey the following cautions when the auto rebuild function is used.

- Do not turn off the power of the server in the interval from a fault of a hard disk to the end of the auto rebuild.
- Install a new hard disk after the interval of 90 seconds or longer has passed from the removal of the defected hard disk.
- If a hard disk is being rebuilt, do not replace another disk. (The disk lamp on the hard disk being rebuilt is lit green or amber alternatively.)

Power Supply (Hot-swap Power Supply Model Only)

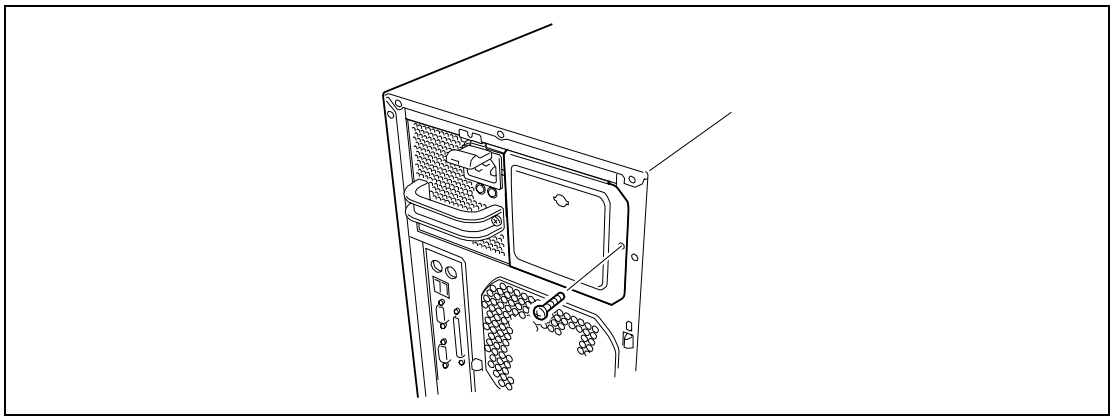
Your server can contain one or two power supplies.

The second power supply is optional and provides a redundant configuration that ensures continued operation of the system in the unlikely event one of the power supplies fails.

Installation

Install the power supply in the following procedure.

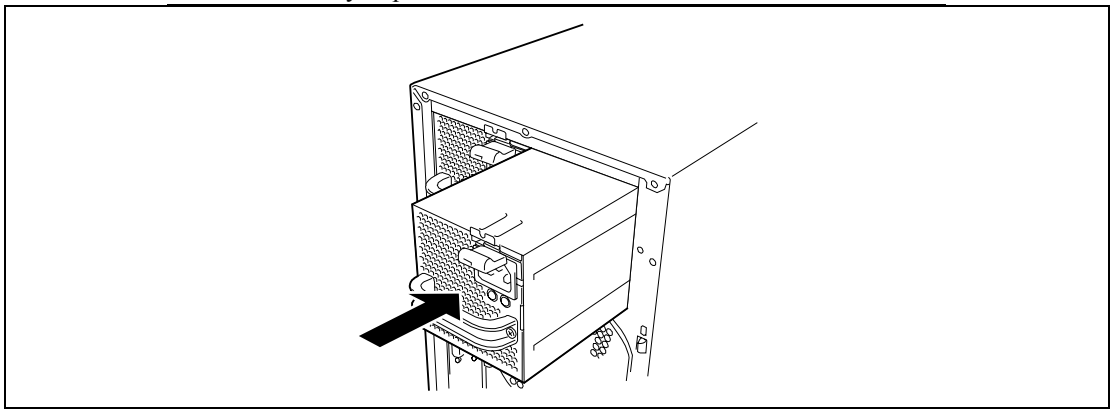
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Loosen a screw securing the blank cover to remove the cover from the chassis.



IMPORTANT: Keep the removed blank cover for future use.

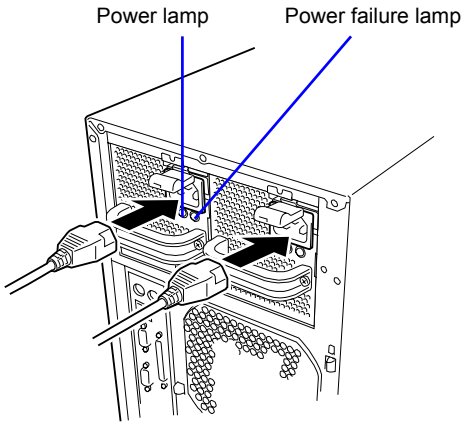
3. Slide the power supply into the vacant slot until it locks.

IMPORTANT: The power supply unit engaging its connector causes the resistance. To avoid damaging the power supply unit, do not tilt or twist the unit as you push it into the connector.



4. Connect two power cords to the AC inlets.

Use the standard power cord coming with the server and the cord coming with the power supply. The Power lamp (green) blinks when the power cords are connected.



5. Turn on the power of the server.

The Power lamps on the power supplies go on.

6. Make sure that any error on the power supply occurs with the status lamp and POST.

See Chapter 8 for details of error indications.

When the power lamp of the power supply is off, reinstall the power supply. If the power lamp is still off, contact your service representative.

Replacement of Defected Power Supply

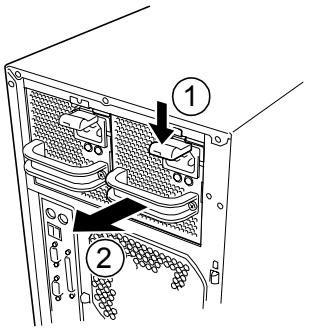
The power supply should be replaced only when it is defected.

> **IMPORTANT:** Do not remove any power supply if it operates normally.

> **NOTE:** When the server (or disk expansion unit) is equipped with two power supplies and one of the power supplies operates normally (with the power lamp of the power supply being on), the other defected power supply can be replaced under the system operation (or in the power-on status). In this case, skip step 2 in the procedure below.

1. Check the Fail lamps (amber) of the power supplies on the rear face and determine which module needs to be replaced. (If a power supply is defected, the Fail lamp is lit amber.)
2. Shut down the system and press the POWER switch to turn off the power.
3. Disconnect the power cord from the failed power supply.
4. While pressing down on the locking tab, grasp the handle and carefully pull the power supply out of the power supply bay.

> **IMPORTANT:** To avoid damaging the power supply unit, do not tilt or twist the unit as you pull it from the power supply bay. The module disengaging from its connector causes the initial resistance you will feel. Use even, steady force to remove the unit.



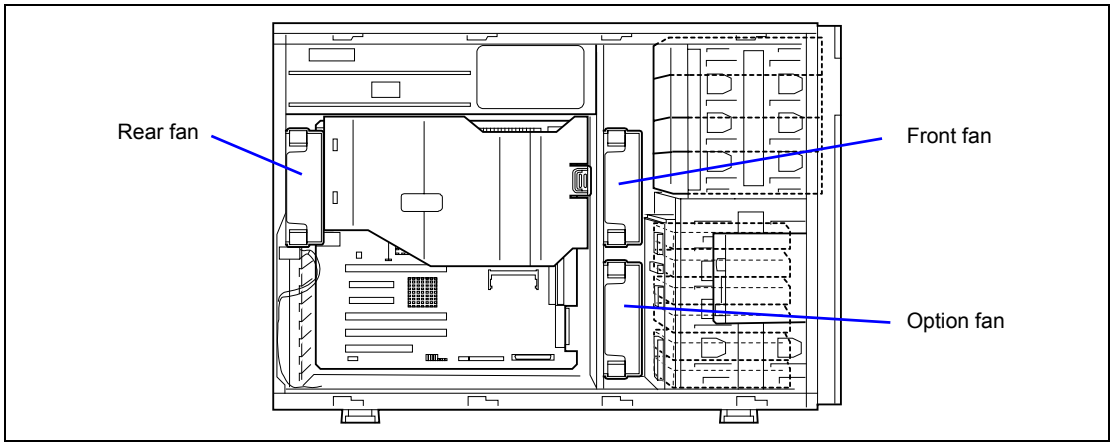
5. If you are not going to install a replacement power supply unit, you must install a blank cover you removed in step 2 of installation procedure to vacant slot.

> **IMPORTANT:** To maintain the cooling effect in the server, install the blank cover in the vacant slot of the power supply bay.

6. Install the power supply referring to steps 3 to 6 of the installation and make sure that the power supply is installed securely.

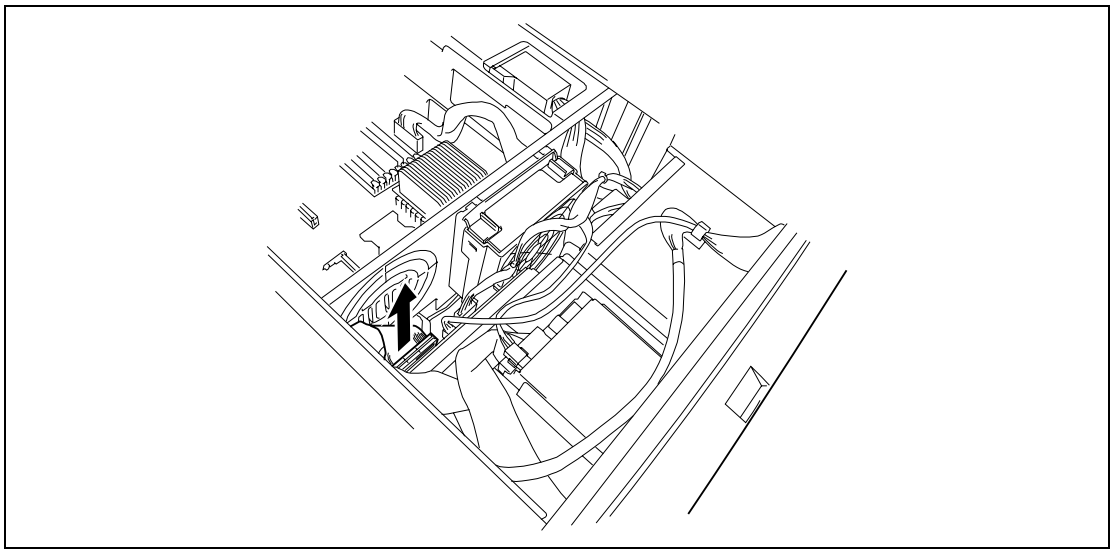
Cooling Fan Unit

Your server can contain up to three cooling fans for cooling the CPU, memory, PCI devices, and hard disk drives.

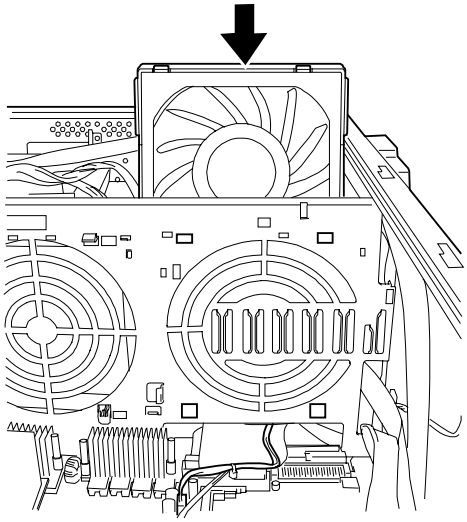


Installation

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the side cover.
3. Disconnect the SCSI cable from the hot-swap SCSI hard disk drive bay.

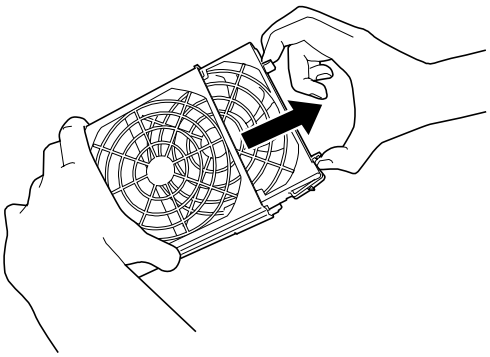


4. Insert the cooling fan unit into the chassis as shown in the figure below.



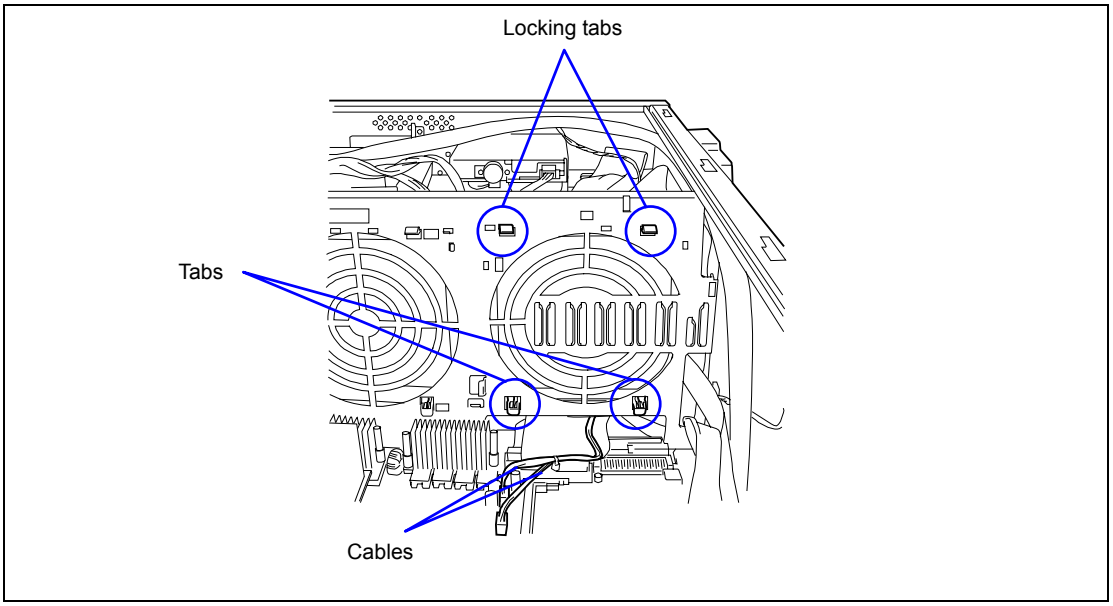
NOTES:

- Pass the cooling fan cables to the mother board connector (see the figure).
- For easy installation, remove the hot-swap fan from the cooling fan unit during installation.

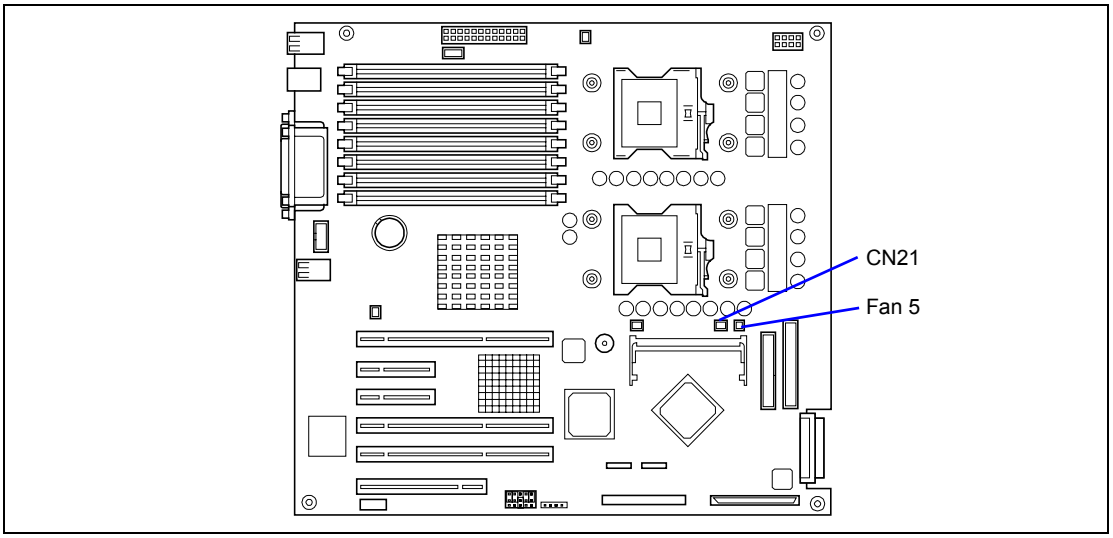


5. Insert the tabs into holes on the frame of the server, and push the cooling fan unit toward the frame.

The cooling fan unit is locked with locking tab.



6. Connect the cooling fan cable to the mother board (see the figure below).



7. Reassemble the removed components.

8. Connect the SCSI interface cable disconnected in Step 3.

Removal

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the side cover.
3. Remove the SCSI interface cable from the hot-swap SCSI hard disk drive bay.
4. Remove the connectors of the fan unit from the mother board.
5. Push the locking tab to unlock the cooling fan unit, and remove the fan unit from the server.
6. Reassemble the removed components.

Hot-swap Fan

Your server accommodates two standard hot-swap fans and one optional hot-swap fan.

> **IMPORTANT:** Do not remove a fan unless you have a replacement unit available. Once you remove a fan from the system, replace it within two minutes.

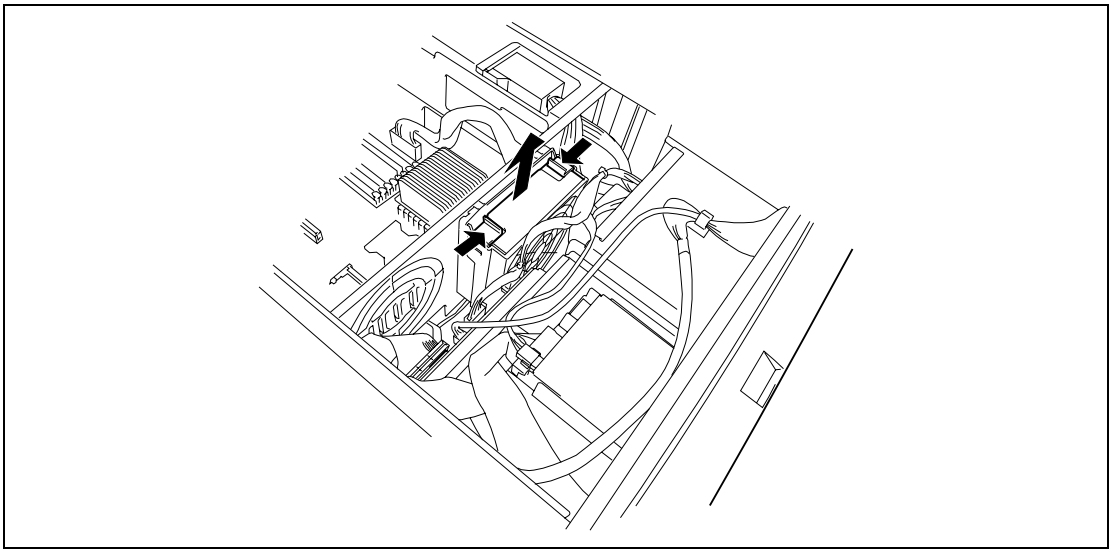
Checking a Fan Status

When a fan is not functioning normally, you can observe the fan failure in the following manner.

- POST error code
- Alert message via NEC ESMPRO application
- System event logged by the optional remote management card

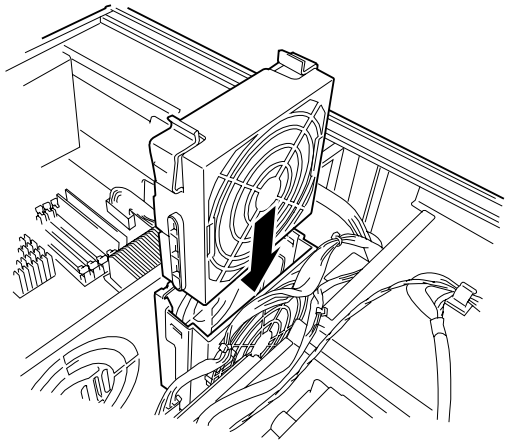
Removal

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the side cover.
3. Grasp the fan module and pull it straight out of the cooling fan unit.
4. Reassemble the removed components.



Installation

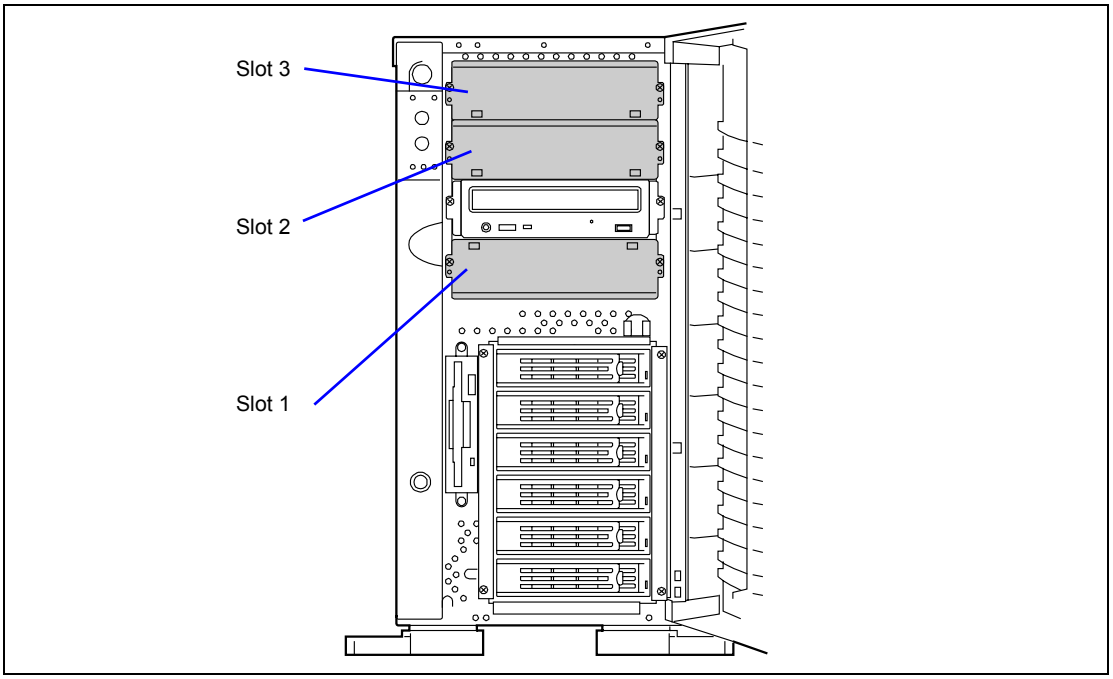
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the side cover.
3. Place the fan module into the empty slot of the cooling fan unit.



4. Reassemble the removed components.

5.25-inch Device

The server contains four slots in which backup devices including CD-ROM and magnetic tape drives can be installed.

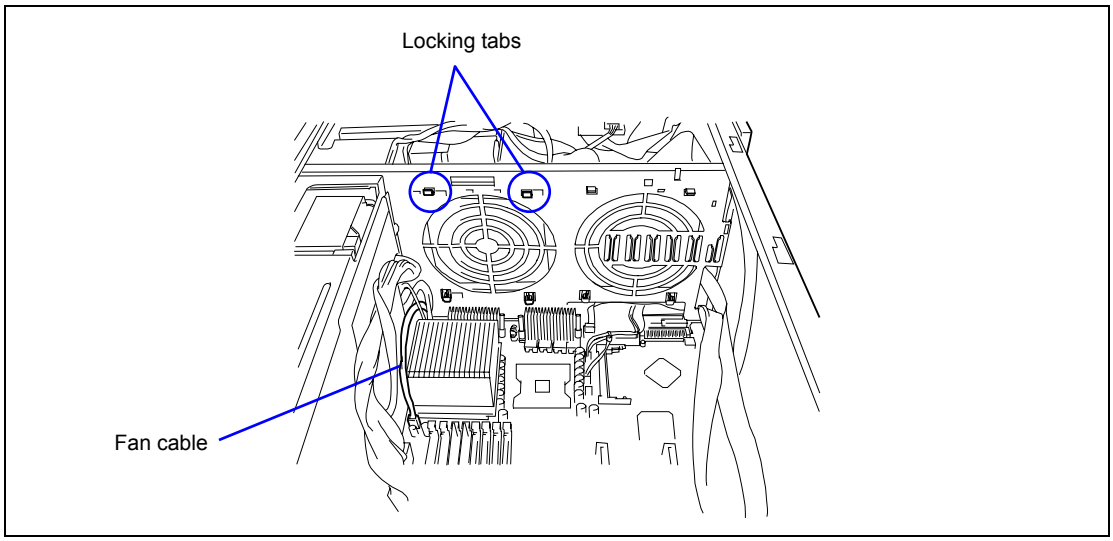


IMPORTANT:

- With the standard configuration, the optional SCSI add-in card and SCSI cable are required.
- Set the SCSI termination of the 5.25-inch device to be installed to OFF and the SCSI ID to a value which is not duplicated or corrupted with that of any other device. Refer to the documentation coming with each of the devices for how to set the values.
- For half-height device, first install a device in slot 1. Then install another device in slot 2.
  For full-height device, install the device to the slots 2 and 3.
- This system can include a maximum of two optional file devices.

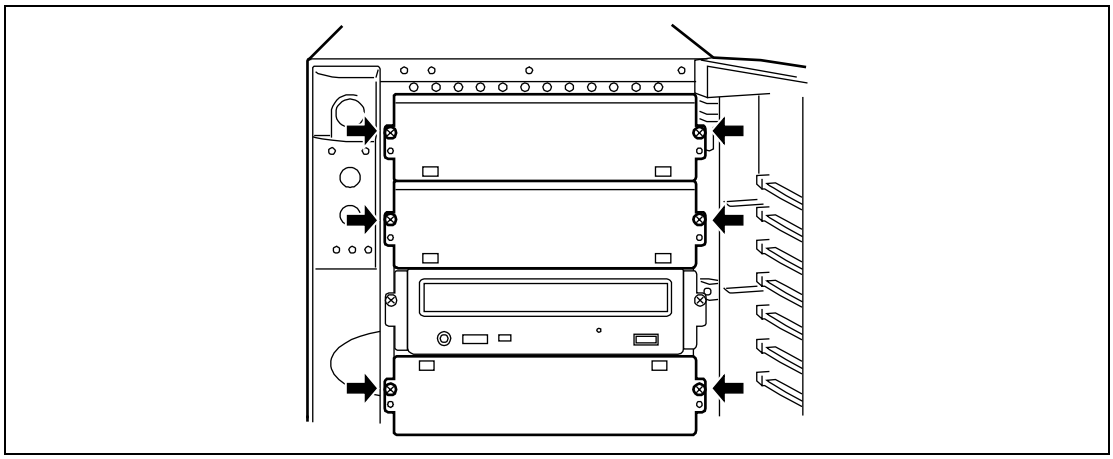
Installation

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the side cover.
3. Disconnect the front cooling fan cable connector from the mother board and remove the front cooling fan unit from the chassis (see the figure below).

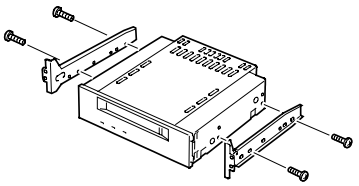


4. Remove the two screws fixing the dummy cover.
5. Pull out the dummy cover toward you carefully.

NOTE: When installing a full-height device, remove two dummy covers.



6. Fix the rails coming with the server to the 5.25-inch device by using the four screws coming with the device.



IMPORTANT:

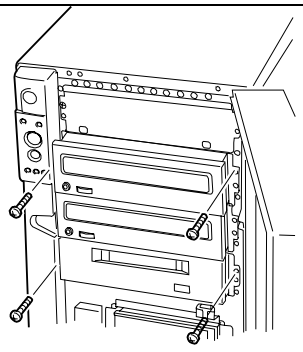
- Always use the screws coming with the 5.25-inch device. Using longer screws or those of different diameter may cause the device to be broken.
- When installing a double-height device, use the DLT device rails that come with the server.

7. Push the 5.25-inch device to the device bay carefully.

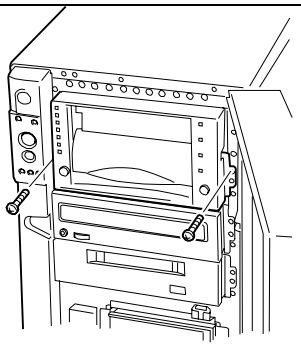
NOTE: Make sure that the cables are not caught while the 5.25-inch device is pushed into the slot.

IMPORTANT: If a 5.25-inch device occupying two slots cannot be inserted easily, push the device to the slots with it lifted a little.

8. Fix the rails by using the screws removed in step 3.



Half-height device



Full-height device

9. Check whether the installed 5.25-inch device is projected too much from the front of the server.

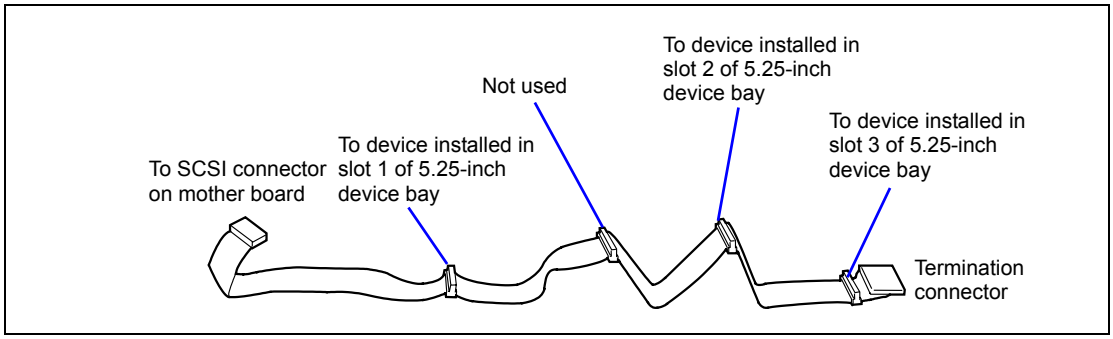
Check the device installed in a 5.25-inch device bay based on the CD-ROM drive normally installed.

10. Connect the SCSI and power cables to the 5.25-inch device installed from the left side of the server.

See "Cable connection" for details.

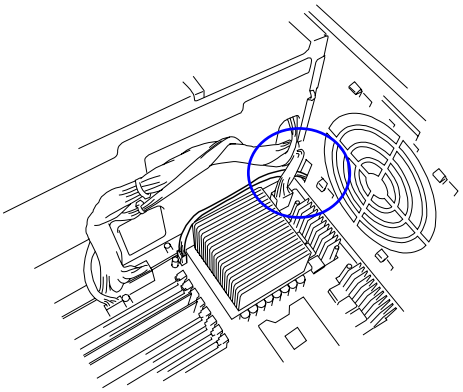
IMPORTANT: Connector pin bending or incomplete connection may cause a malfunction to occur. Provide the connection securely watching the 5.25-inch device and cable connectors.

NOTE: Make sure that the cable is not caught.


To device installed in slot 2 of 5.25-inch device bay
Not used
To device installed in slot 3 of 5.25-inch device bay
To device installed in slot 1 of 5.25-inch device bay
To SCSI connector on mother board
Termination connector

11. Install the removed components.

IMPORTANT: Run the SCSI cable and CD-ROM drive ribbon cable as shown in the figure below.



12. Provide the setup for the server referring to "SCSI BIOS" in Chapter 4.

Removal

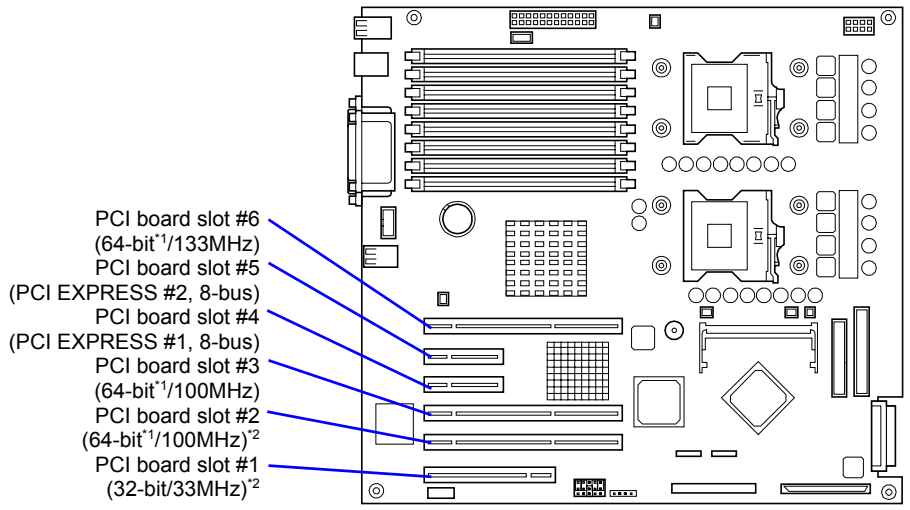
Remove the 5.25-inch device in the reverse procedure of the installation.

PCI Board

The server contains six slots into which PCI boards can be inserted.

IMPORTANT: Any PCI board is easily affected by static electricity. Handle a PCI board after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with terminals and components on the PCI board. In addition, do not put the PCI board on a desk directly. See "Static Precautions" in this chapter for details of the static electricity.

NOTE: When a PCI board is installed, removed, or removed from the present slot and then installed in another slot, modify the detailed settings including the interrupt lines (IRQ) by using the BIOS setup utility SETUP if necessary. See Chapter 4 for the settings of the interrupt line states and I/O spaces at the shipment of the server.



*1 The system operates at the rate of 33 MHz when PCI boards operating only at 33 MHz are installed in these slots.

*2 Do not install a set of PCI boards providing a specific function to extend over both the 64-bit and 32-bit PCI buses.

Installation

Install a board connected to a PCI board slot in the following procedure.

IMPORTANT:

- For ease of installation, remove the external SCSI cable when installing the full-length PCI card.
- 3.3V or universal PCI boards can be installed in PCI board slots #2, #3, and #6.
- 5V or universal PCI boards can be installed in PCI board slot #1.

NOTE: To install a PCI board, make sure that the board connecting section is engaged with the connector of the PCI board slot.

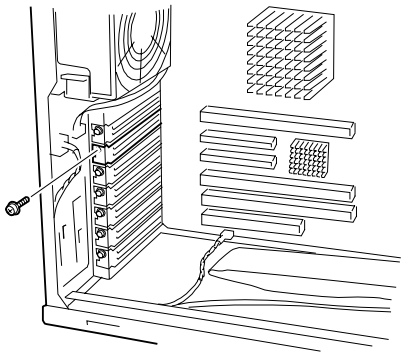
List of optional devices and their available slots

P/N	Board name	Slot	PCI #1	PCI #2	PCI #3	PCI #4	PCI #5	PCI #6
			32-bit/ 33MHz	64-bit/ 100MHz		PCI EXPRESS		64-bit/ 133MHz
		Slot size	Full-height					
		Voltage	5V	3.3V				
		Available board size	Long/short					
N8103-65F	SCSI Controller		√	√	√	–	–	√
N8503-56F	SCSI Controller		√	√	√	–	–	√
N8103-75F	SCSI Controller		√	√	√	–	–	√
N8103-86F	Disk Array Controller (0ch)		–	√	–	–	–	–
N8103-80F	Disk Array Controller (1ch)		√	√	√	–	–	√
N8103-81F	Disk Array Controller (2ch)		√	√	√	–	–	√
N8190-105	Fibre Channel Controller		√	√	√	–	–	√
N8104-111	100BASE-TX Adapter		√	√	√	–	–	√
N8104-86	100BASE-TX Adapter (2ch)		√	√	√	–	–	√
N8104-103	1000BASE-T Adapter		√	√	√	–	–	√
N8104-113	1000BASE-T Adapter (2ch)		√	√	√	–	–	√
N8104-112	1000BASE-SX Adapter		√	√	√	–	–	√
N8191-07	ICMB Connector		√	√	√	√	√	√
attached to N8115-02	PCI bracket for Advanced Remote Management		√	√	√	√	√	√

√: Installation enabled, –: Installation disabled

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the side cover.
3. Remove a screw securing the expansion slot cover.
4. Remove the expansion slot cover.

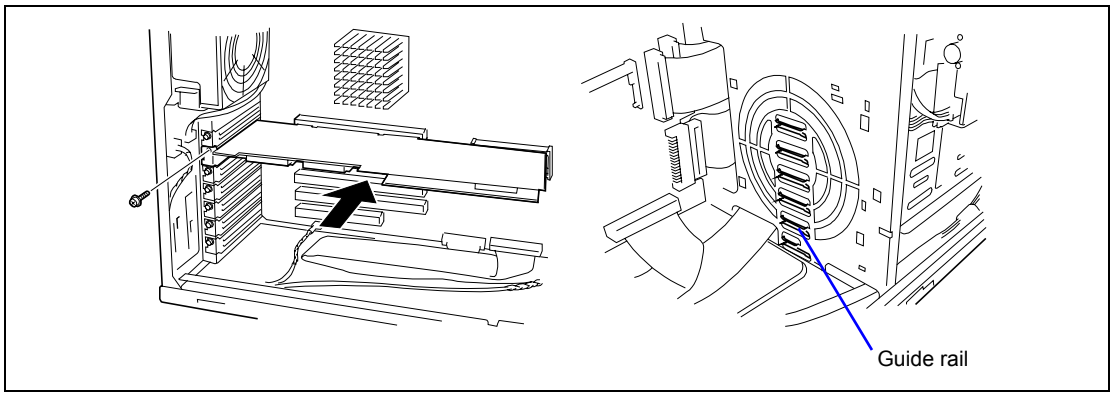
IMPORTANT: Keep the expansion slot cover being removed carefully.



5. On the edge opposite the connectors, grasp the board by both corners. Orient the board to the vacant slot so that the metal retention bracket is toward the rear of the chassis.

6. Insert the board into the front retention mechanism and rear guide rails. Carefully push the board until it engages and fully seats in the slot connector.

> **IMPORTANT:** If the board cannot be installed easily, remove the board once and then reinstall it. Excess force added to the board may cause the board to be broken.



7. Fix the board with a screw removed in Step 4.
8. Reinstall the removed components.
9. Turn on the power of the server. Then make sure that any error message does not appear in POST.

   If an error message appears, write down the message and review the error message list in Chapter 8.
10. Start the BIOS Setup Utility to set the "Reset Configuration Data" in the "Advanced" menu to "Yes".

    This is required to update the hardware configuration information. See Chapter 4 for details.

Removal

Remove the board in the reverse procedure of the installation. Then install the additional slot cover.

RAID Controller Board

The RAID controller board is an optional PCI board developed to improve data reliability. The board can be installed to use the hard disks in the 3.5-inch disk bay of the server and those in additional disk unit in the disk array configuration.

The server can include the following optional RAID controller.

- SCSI disk array controller (N8103-80F, single-channel)
- SCSI disk array controller (N8103-81F, dual-channel)
- SCSI disk array controller (N8103-86F, 0 channel)

See the manual that comes with your RAID controller for detail.

Function of disk array controller	Description
Level	Refer to the manual that comes with your optional RAID controller for the supported RAID level.
Hot plug	Allows a device such as a hard disk to be replaced under the system operation status.
Auto rebuild	After the defected hard disk is replaced with a new one, the data saved in the defected hard disk is automatically recovered from the data saved in the remaining hard disks.
Expand capacity	The addition of a hard disk without system interruption can automatically expand the area in which disk arrays are available.

Cautions

Note the following on the configuration of a disk array.

- The disk array controller board is easily affected by static electricity. Handle the disk array controller board after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with terminals and components on the disk array controller board. In addition, do not put the disk array controller board on a desk directly. See "Static Precautions" for details of the static electricity.
- To change the disk array configuration or the RAID, the hard disks must be initialized. If important data is saved in the hard disks used to constitute a disk array, first back up the data in other hard disks before installing boards and configuring the disk array.
- More than one hard disk is required to configure a disk array.
- Hard disks used in the disk array configuration should have the same disk revolution rate and capacity in packs.
- See "PCI Board" in this Chapter for the slot in which a board can be installed.
- Up to four disk array controller boards can be installed in the server.
- Several RAID (Redundant Arrays of Inexpensive [Independent] Disks) levels can be set for the disk array configuration in the server in which disk array controller boards are installed. Refer to the online document saved in "NEC EXPRESSBUILDER" CD-ROM coming with the server or the documentation coming with the disk array controller for

details of the available RAIDs, data transfer rate, and array configuration.

- The available capacity of the hard disks in the disk array configuration is lower than the total capacity of the hard disks configuring the disk array while the disk reliability is improved.
- Set "PCI Slot n ROM (n: slot number)," a parameter of the slot in which a hard disk is installed, to "Enable" in "PCI Configuration" on the Advanced menu of the BIOS utility SETUP.
- Replacement of disk array controller board

  Restore the disk array configuration information in the disk array controller boards. Use the configuration utility for the restoration. Refer to the online document saved in CD-ROM "NEC EXPRESSBUILDER" coming with the server or the documentation coming with the disk array controller for details. If a disk array controller is replaced, create the configuration information newly by using the proper utility.
- When more than one disk array controller board are installed in the server, install the disk array controller board to which the system disk to be booted is connected in the lowest PCI slot number. For example, if four disk array controller boards are installed in PCI slots #2, #3, and #6, the system disk should be connected to the board installed in PCI slot #1.

Slot No.	Boot priority
#6	6
#5	5
#4	4
#3	3
#2	2
#1	1

Using Internal Disks in Disk Array Configuration

For the installation of the RAID controller board, see "PCI Board" and the manual that comes with the RAID controller board.

Disk Array Configuration of Additional Disk Unit

The N8141-36F additional disk unit is exclusively used for installation of hard disks. The cabinet can contain up to 14 hard disks. The server equipped with disk array controller boards can be connected with up to four additional disk units. (See Chapter 10 or the documentation coming with the additional disk unit for details of the additional disk units.)

IMPORTANT:

- The additional disk unit does not contain hard disk drives. Purchase the drives additionally.
- To connect with additional disk unit, use the server of rack-mount type, or use the additional disk unit of tower type (pedestal type). In both cases, you need an optional conversion kit.

To connect the server with the N8141-36F additional disk unit, any of the following optional cables are required:

- K410-93(01) additional disk unit connecting SCSI cable
- K410-93(03) additional disk unit connecting SCSI cable
- K410-93(06) additional disk unit connecting SCSI cable

After the connection of the additional disk unit to the server, provide the disk array configuration for the additional disk unit by using the Disk Array Configuration. See the manual that comes with the disk array controller for details of the procedure.

In the disk array configuration of the additional disk unit, the auto rebuild function which the disk array controller board has can recover the data if any one of hard disks installed in the additional disk unit is defected to destroy data. (Replace the defected hard disk with a new one with the power being on (hot-swap)).

SCSI Controller Board

SCSI controller board (N8103-56F/65F/75F) is a PCI board to control hard disk drives and file devices that operate through the SCSI interface.

The SCSI controller board is necessary in the following cases:

- Installing a file device in the 5.25-inch device bay of the server
- Using a SCSI hard disk as an internal hard disk
- Connecting external SCSI equipment.

Notes

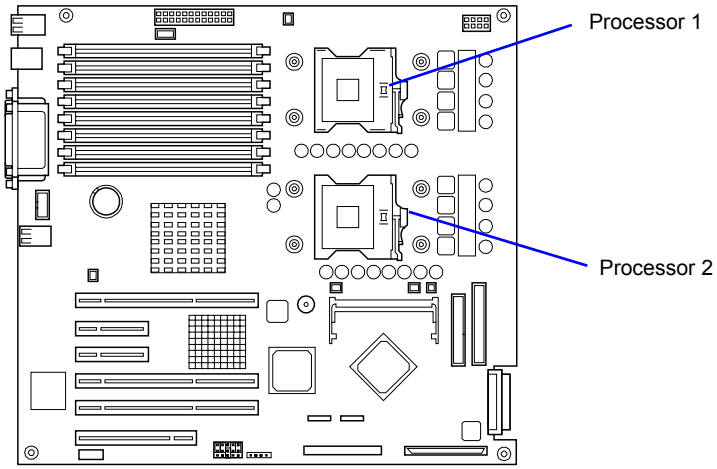
The following explains notes on using the SCSI controller board:

- The SCSI controller board is an electronic component easily affected by static electricity. Before handling the SCSI controller board, discharge static electricity from your body by touching the metal frame of the server or the like. Do not touch the terminals or parts of the SCSI controller board with your bare hands, or do not place the SCSI controller board directly on a desk. See "Static Precautions" for details on static electricity.
- When connecting hard disks containing an OS to the SCSI controller board, install them in the PCI slots in ascending order of the slot numbers.
- See "PCI Board" described earlier in this chapter for slots in which boards can be installed.

Processor

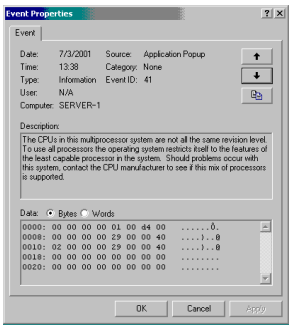
The mother board includes two Intel Xeon ZIF sockets. The primary and secondary processor sockets are located as shown in the figure below.

IMPORTANT: Any CPU is easily affected by static electricity. Handle a CPU after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with the CPU pins. In addition, do not put any CPU on a desk directly. See "Static Precautions" for details of the static electricity.



Mother board

NOTE: If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information every startup. If this message is logged, it is no problem for operation.

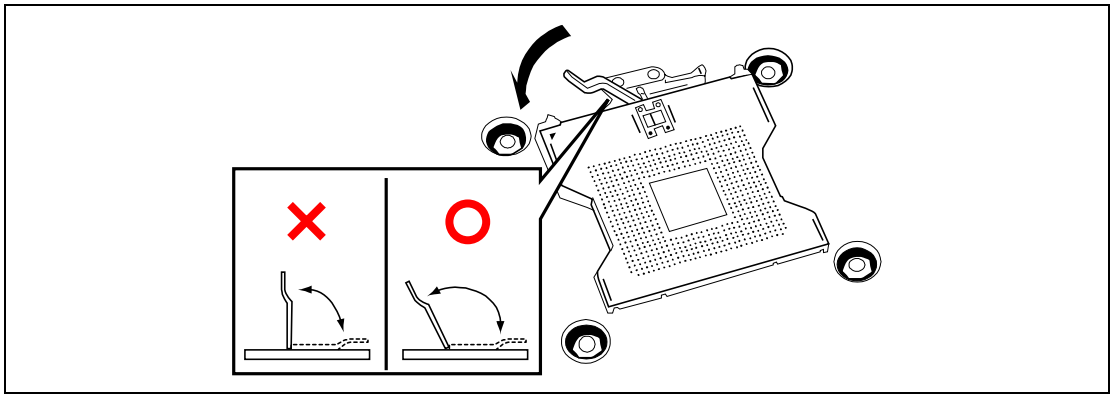

Event Properties
Event
Date: 7/3/2001 Source: Application Popup
Time: 13:38 Category: None
Type: Information Event ID: 41
User: N/A
Computer: SERVER-1
Description:
The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacturer to see if this mix of processors is supported.
Data: Bytes Words
0000: 00 00 00 00 01 00 4A 00 .....J.
0008: 00 00 00 00 29 00 00 40 ....)..@
0010: 02 00 00 00 29 00 00 40 ....)..@
0018: 00 00 00 00 00 00 00 00 ....
0020: 00 00 00 00 00 00 00 00 ....
OK
Cancel
Apply

Installation

Install a CPU in the following procedure.

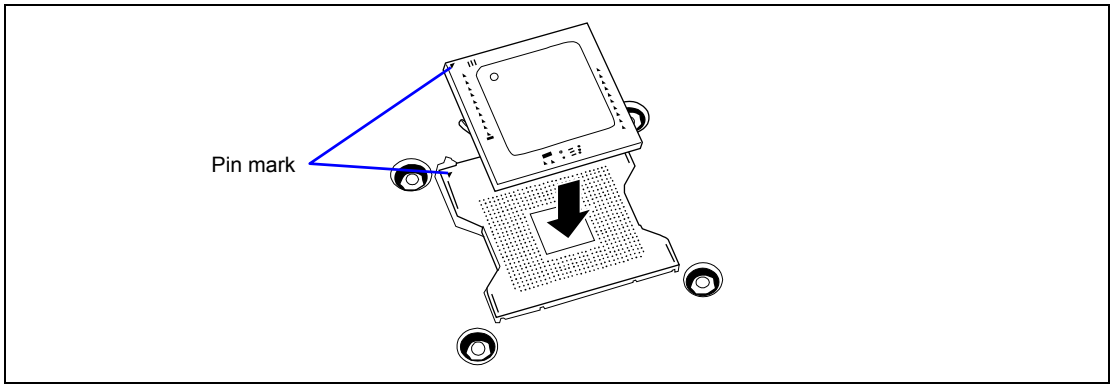
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the components as follows:
   - Side cover
   - Top air duct
3. Locate the CPU socket which you are going to install CPU.
4. Raise the locking lever on the socket.

IMPORTANT: Open the lever until it stops. The bar can be opened to approx. 120 degrees.

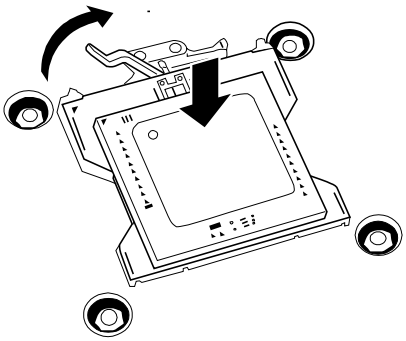


5. Aligning the pins of the CPU with the socket, insert the CPU slowly and gently into the socket.

IMPORTANT: Be aware of CPU direction. Pin layouts on two corners among four differ from others to prevent an incorrect insertion. Confirm the pin mark and pin layout on the socket, and insert the CPU correctly.

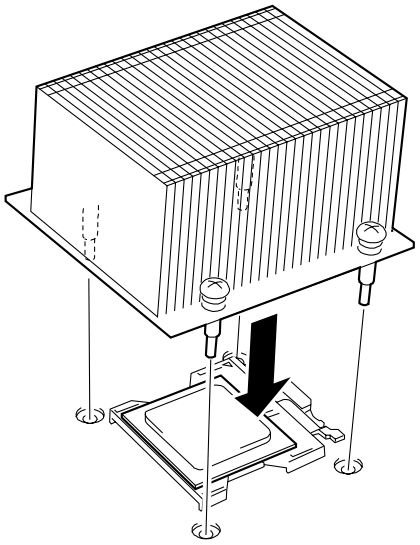


6. Push the CPU lightly to the socket, and push down the lever to secure the CPU.



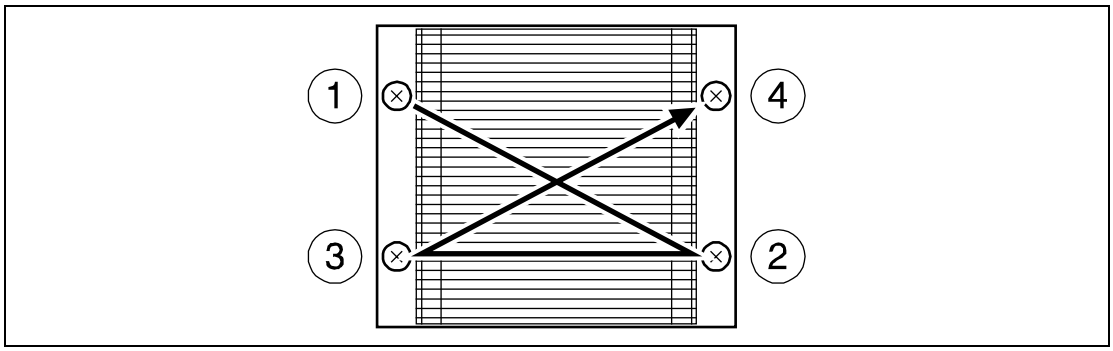
7. Put the heat sink on CPU.

NOTE: Be aware of direction of heat sink (see figure below).



8. Secure four screws to fix the heat sink.

NOTE: Tighten four screws temporarily in the following order shown in the figure below, and then completely tighten all screws.



9. Make sure that the heat sink is level.

NOTES:

- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
  - The CPU is not positioned correctly.
  - The wire clip is not engaged correctly.
- Do not move the secured heat sink.

10. Install the components you removed previously.

11. Power on the server, start the SETUP utility, and set "Processor Retest" of "Processor Settings" on the Main menu to "Enable".

12. Verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

13. Set "Reset Configuration Data" on the Advanced menu to "Yes".

This setting is required to change the hardware configuration data. See Chapter 4 for details.

14. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, do the procedure below:

For the Windows operating system, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system (see Chapter 5).

Removal

To remove the CPU, prepare the removal referring to steps 1 and 7 in the installation procedure and do the reverse procedure of steps 13 to 9.

IMPORTANT:

- Do not remove any CPU unless it is failed.
- To maintain the cooling effect in the server, install the dust cover onto the processor #2 socket when the CPU is not installed to #2 socket.
- After the operation, heat may make the cool seat at the bottom of the heat sink adhere to the CPU. To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or socket to be defected.

Do the following procedure if a CPU is removed (or replaced).

1. Start SETUP to select menus "Main" – "Processor Settings" – "Processor Retest" in the order to clear the error information on the removed CPU (see Chapter 4).

   When a CPU is replaced, select menus "Main" – "Processor Settings" to confirm that the ID and L2 Cache of the additional CPU are defined normally (see Chapter 4).

2. Set "Reset Configuration Data" on the Advanced menu to "Yes."

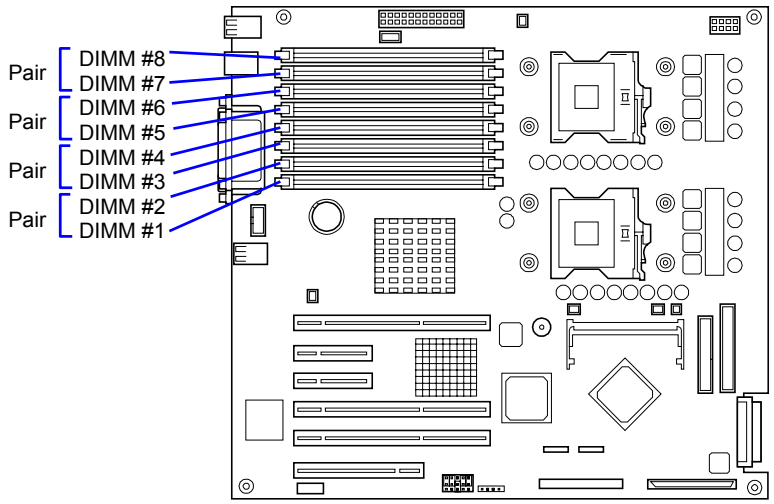
   This is required to update the hardware configuration information. See Chapter 4 for details.

DIMM

The DIMM (Dual Inline Memory Module) is installed in a DIMM socket on the mother board installed in the server.

The mother board contains four sockets in which DIMMs are installed. Two DIMMs are normally installed in DIMMs #5 and #6. (The DIMMs normally installed may be replaced.)

DIMMs are installed on the sockets in the ascending order of DIMM socket numbers in the unit of two modules.



Mother board

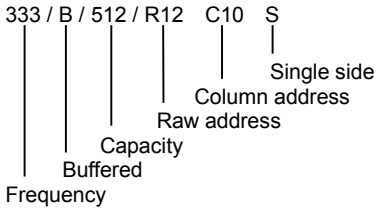
IMPORTANT:

- The DIMM is easily affected by static electricity. Handle the DIMM after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with terminals and components on the DIMM. In addition, do not put the DIMM on a desk directly. See "Static Precautions" for details of the static electricity.
- Do not use any DIMM not approved by NEC. If an unapproved third party's DIMM is installed in the server, not only the DIMM but also the server itself may be defected. You will be charged by any repair of a malfunction or defect caused by such a device within the warranty period.
- Due to an interleave device, add two DIMMs in banks.*1 The server does not operate if DIMMs of different specifications are installed in a single bank.

*1 Each pair of slots #1 and #2, slots #3 and #4, slots #5 and #6, and slots #7 and #8 in the figure on the previous page constitutes a bank.

*2 The specification of a DIMM is described on the label put on the board as follows:

Example: Frequency of 333 MHz, buffered, capacity of 512 MB, raw address of 12 bits, column address of 10 bits, and single side



- DIMMs must be populated in pairs and in the following order: #5 and #6, #3 and #4, #1 and #2, then #7 and #8.
- Install DIMMs starting from the one having largest capacity.
- Installed DIMMs must be the same speed and must all be registered.
- Take a note of beep code pattern, and take appropriate action according to the table listed earlier in "Beep Codes".

NOTES:

- Up to 16GB (2GB × 8) of memory can be added.
- If six or more DDR333 SDRAMs are installed, the system operates at DDR266 standard.
- In the error messages and logs in POST, NEC ESMPRO Manager, or Off-line Maintenance Utility, the DIMM connector may be called group. The number next to a group meets the connector number in the figure shown in the previous page.

Installation

Install a DIMM in the following procedure.

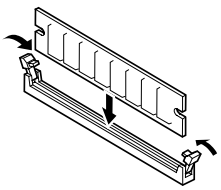
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the components as follows:
   - Side cover
   - Top air duct
3. Confirm the socket in which a DIMM is installed.
4. Open the levers at both ends of the socket.

> **IMPORTANT:** To avoid damaging the lever, do not apply an excess force to the lever.

5. Push the DIMM to the socket straight.

> **NOTE:** Use extreme care when installing a DIMM. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

If the DIMM is inserted into the DIMM socket, the lever is automatically closed.



> **IMPORTANT:** Install a pair of DIMMs at a time. In addition, use a set of memory devices with the same specification. The specification of a memory device is described on the label put on the device as follows:
>
> Example: Frequency of 333 MHz, buffered, capacity of 512 MB, raw address of 12 bits, column address of 10 bits, and single side
>
> 333 / B / 512 / R12 C10 S
>
> - S: Single side
> - C10: Column address
> - R12: Raw address
> - 512: Capacity
> - B: Buffered
> - 333: Frequency

6. Gently push the levers to the upright position until they engage the notches in the DIMM
7. Install the remove components.
8. Turn on the power of the server. Then make sure that any error message does not appear in POST.

   If an error message appears, write down the message and review the error message list in Chapter 8.
9. Start SETUP to select "Advanced" → "Memory Configuration" on menus. Then make sure that the status of the additional DIMM is set to "Normal" (see Chapter 4).
10. Set "Reset Configuration Data" on the Advanced menu to "Yes".

    This is required to update the hardware configuration. See Chapter 4 for details.
11. When the Windows operating system is used, set the paging file size to the recommended value or larger.

    Installed memory capacity × 1.5 (See Chapter 5.)

Removal

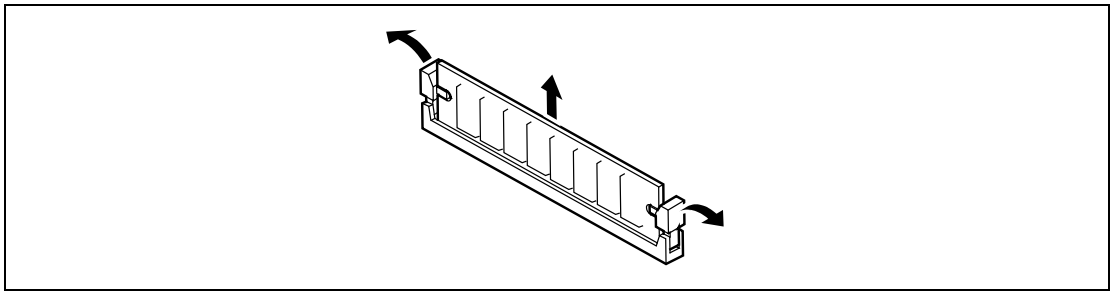
Remove the DIMM depending on the following procedure.

NOTES:

- To remove the defected DIMM, check the error message appearing in POST or NEC ESMPRO to identify the DIMM socket (group) in which the defected DIMM is installed.
- The server operates only when at least two DIMMs are installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the side cover.
3. Expand the levers at the both ends of the socket for the DIMM to be removed leftward or rightward

   The lock is released to allow the DIMM to be removed.



4. Turn on the power of the server. Then make sure that any error message does not appear in POST.

   If an error message appears, write down the message and review the error message list in Chapter 8.
5. Start the SETUP to select "Advanced" → "Memory Configuration" → "Memory Retest" on the menus to clear the error information on the removed DIMM (see Chapter 4).
6. Set "Reset Configuration Data" on the "Advanced" menu to "Yes."

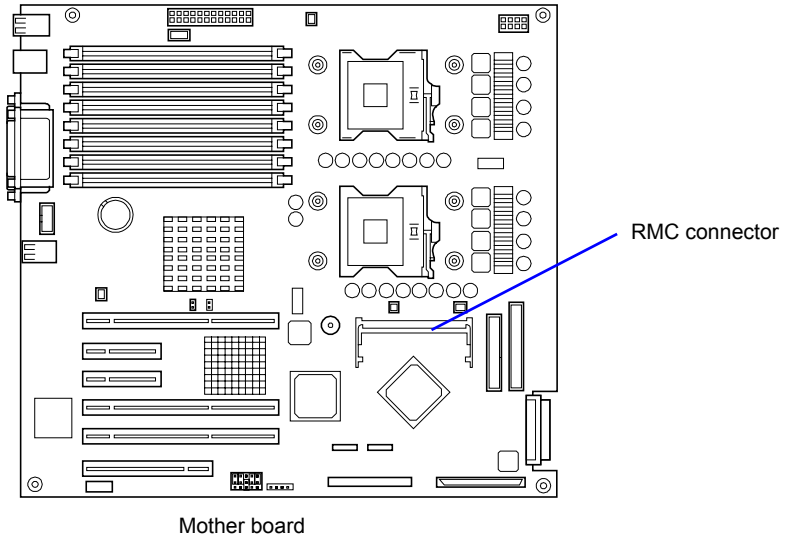
   This is required to update the hardware configuration information. See Chapter 4 for details.

Remote Management Card (RMC)

Remote Management card (RMC) is an optional expansion card that includes the Baseboard Management Controller (BMC) based on IPMI 1.5.

See Chapter 2 for detail functions of RMC.

IMPORTANT: The RMC is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the RMC. Do not touch the RMC terminal pins by bare hand or place the RMC directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.



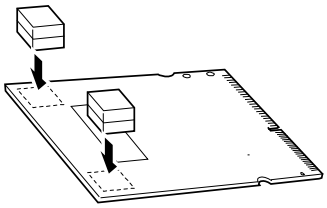
NOTE: The illustrations in this subsection might slightly differ from your optional remote management card.

Installation

Follow these steps to install the RMC.

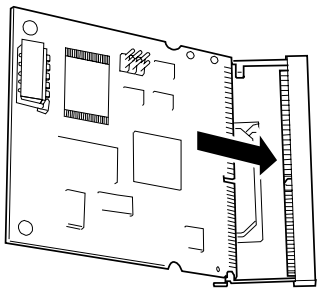
1. See section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the logic cover.
4. Adhere the shock absorbers to the back of the RMC.

   Refer to the manual that comes with the RMC for detail location.

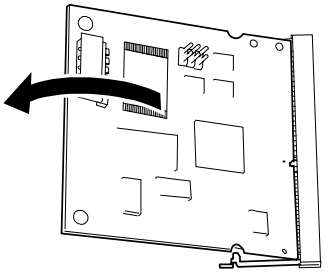


5. Insert the RMC into the RMC connector.

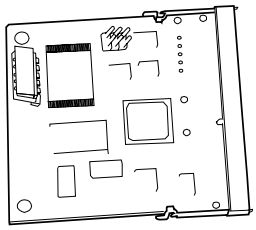
   Align the notch in the bottom of the RMC with the keyed socket on the RMC connector.



6. Press down the RMC until it locks.



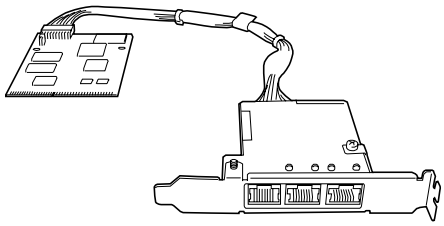
7. Check to see that the RMC is fixed with both levers on the RMC connector.



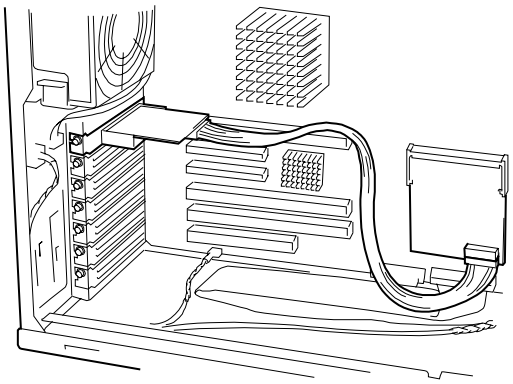
8. <Advanced Remote Management card (ARMC only)>

a) Assemble the management network card that attached to the ARMC and install the card to the riser card.

b) Connect the internal cable that attached to ARMC to ARMC and the management network card as shown in the figure below.



The following figure shows the cable routing of the internal cable.



9. Reassemble the server.

10. Turn on the server and check that the no error messages other than the following message are displayed on the POST screen.

```
H/W Configuration of BMC is corrupted.
!!Update BMC H/W Configuration by configuration tool!!
!!Refer to BMC configuration manual!!
```

See Chapter 8 for POST error messages.

11. Place the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the server.

12. Run "Initialize Remote Management Card".

    Refer to Chapter 6 for details.

13. Run BIOS SETUP utility and check to see that the menus related to the RMC are displayed.

    Refer to Chapter 4 for details. If no additional menus are displayed, reinstall the RMC.

14. In the BIOS SETUP utility, select "Yes" for [Reset Configuration Data] in the [Advanced] menu.

    This setting is required to change the hardware configuration data. See Chapter 4 for details.

15. Reboot the server and run NEC EXPRESSBUILDER to save system information.

    Refer to Chapter 3 or 6 for details.

16. If the advanced remote management card is installed and KVM console feature is used, update the graphics accelerator (see Chapter 5).

    NOTE: Refer to the manual that comes with an optional advanced remote management card for the monitor resolution.

17. Uninstall NEC ESMPRO Agent if installed.

18. (Re)install NEC ESMPRO Agent.

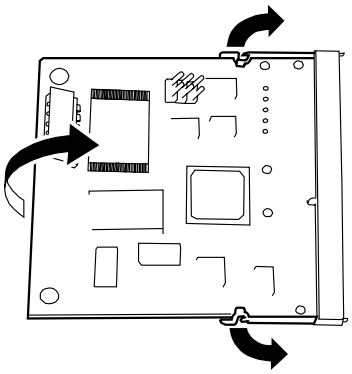
    To correct the system information and event log from the management PC, NEC ESMPRO Agent must be installed in the server.

Removal

1. See section "Preparing for Installation and Removal" described earlier to prepare.

   IMPORTANT: The remote management card logic monitors and logs system voltage changes. When removing the RMC from the motherboard, you may experience a 3 - 4 second delay from the time your system powering down.

2. Pull out the server from the rack.
3. Open the logic cover.
4. Open the levers on the both sides of the RMC connector to unlatch the RMC.



5. Remove the RMC from the connector.
6. Run BIOS SETUP utility and check to see that menus related to the RMC are not displayed in the Server menu.

   See Chapter 4 for details.

7. Run BIOS SETUP utility and select "Yes" for [Reset Configuration Data] in the [Advanced] menu.

   This setting is required to change the hardware configuration data. See Chapter 4 for details.

8. Uninstall NEC ESMPRO Agent if installed.
9. (Re)install NEC ESMPRO Agent.

   To correct the system information and event log from the management PC, NEC ESMPRO Agent must be installed in the server.

Chapter 10

Internal Cabling Diagrams

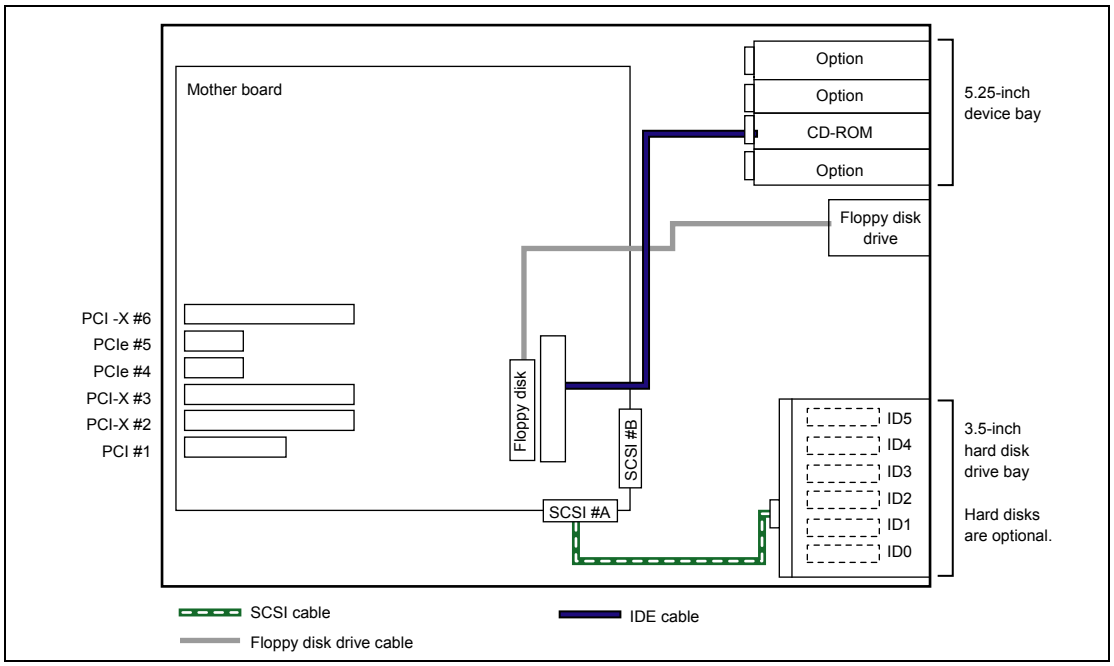
Internal cable connections of the server are shown below.

INTERFACE CABLES

An example of the connections of interface cables between devices within the server and external devices is shown below.

Standard Configuration

The figure below shows an example of the connections in the standard configuration.



Disk Array Configuration of Built-in Hard Disks

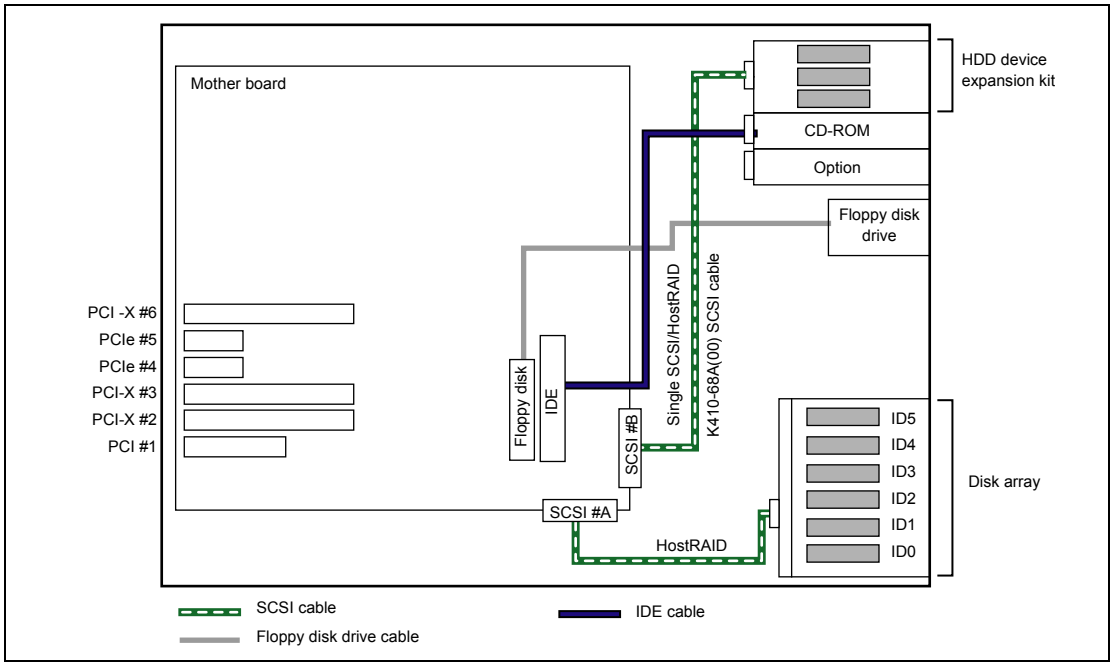
Using Onboard RAID Controller

The onboard SCSI controller supports the HostRAID feature that allows the internal hard disk drives to build the RAID configuration.

The figure below shows the cabling diagram that the standard hard disk drive bay and optional HDD device expansion kit are used with the RAID configuration.

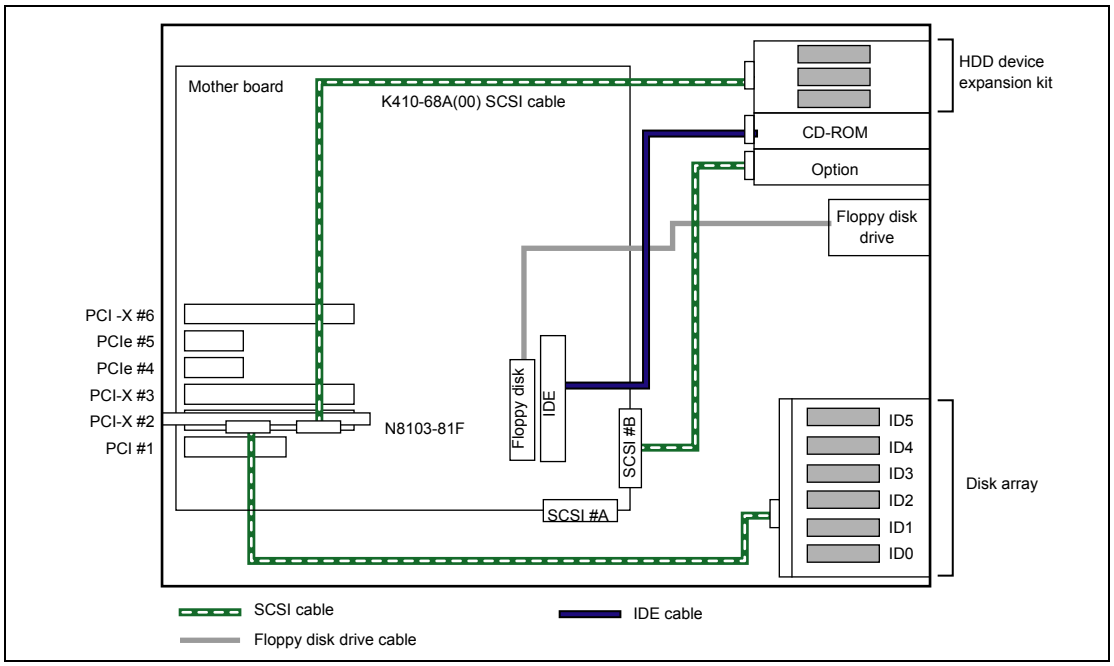
HostRAID supports the RAID levels of RAID0 and RAID1.

To enable HostRAID, run the SCSI BIOS utility (see online document in the NEC EXPRESSBUILDER CD-ROM).



Using Optional RAID Controller (N8103-80F/81F)

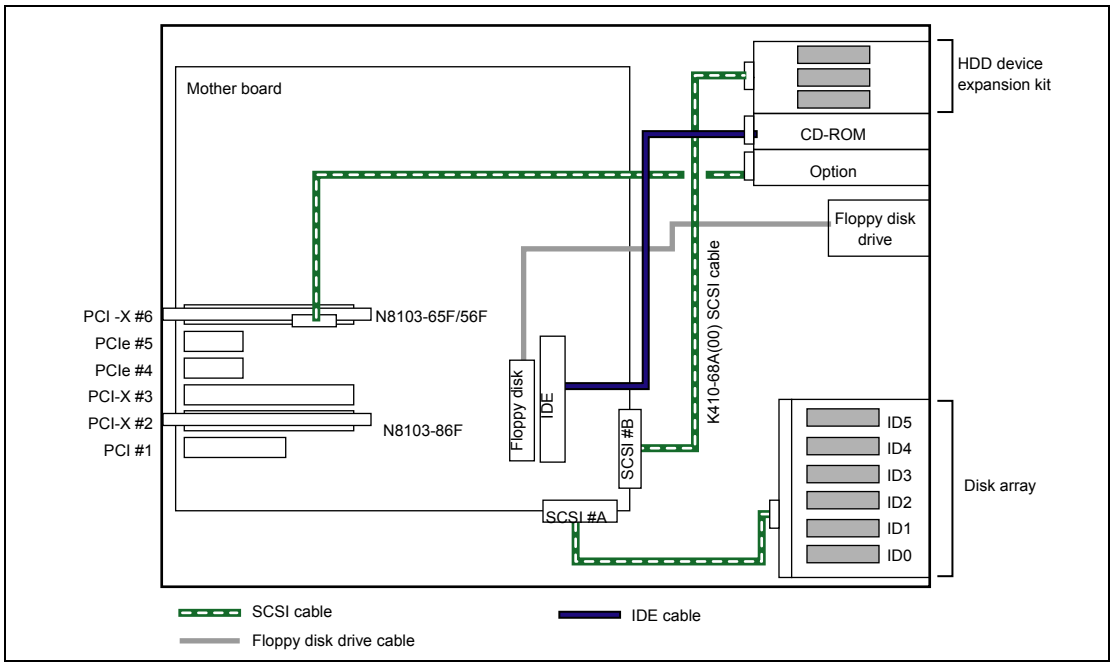
The N8103-80F/81F is an optional add-in PCI RAID controller that supports the RAID levels of RAID0, RAID1, and RAID5.



Using Optional RAID Controller (N8103-86F)

The N8103-86F (0ch) has no SCSI connectors. The N8103-86F controls the hard disk drives via the onboard SCSI channels. The connected SCSI hard disk drives are configured in the RAID levels of RAID0, RAID1, and RAID5.

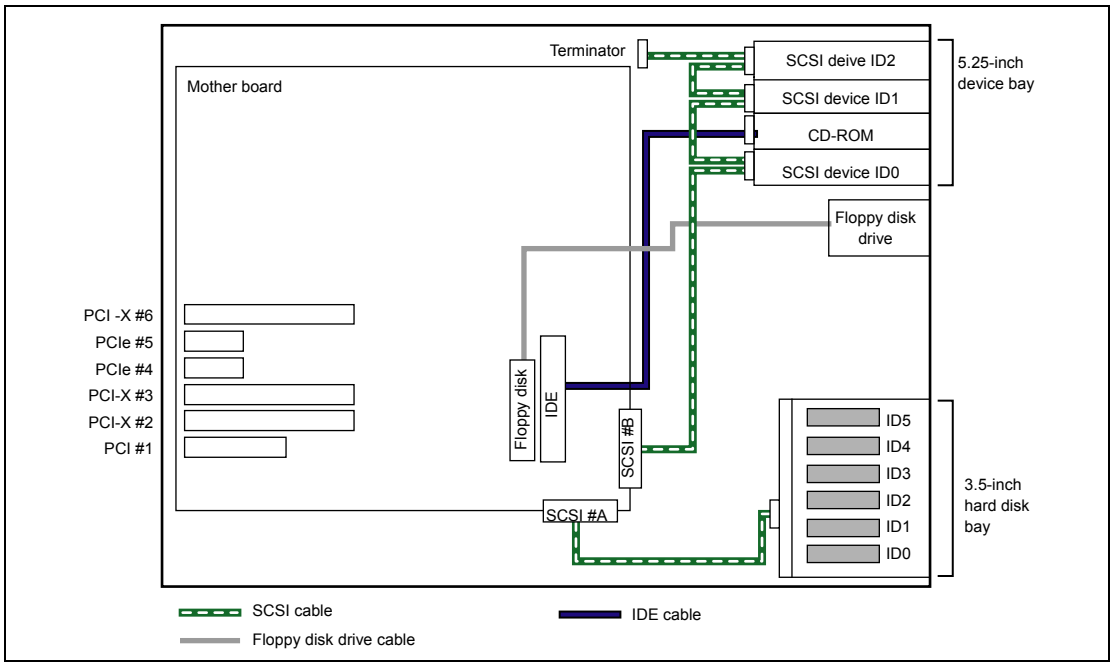
The both of two onboard SCSI channels are controlled by the N8103-86F (0ch) RAID controller. If you want to add the SCSI file devices in your system, an optional SCSI add-in controller is required (see figure below).



Installing a SCSI File Device

With the standard configuration, you need an optional SCSI controller and internal SCSI cable to install a file device.

> **IMPORTANT:** Onboard SCSI channels are controlled for the RAID hard disk drives when an optional RAID controller (N8103-86F) is installed.



Set SCSI IDs as shown in the above figure. Set the terminator (Enabled/Disabled) for the last-connected device in the SCSI chain. Set "Disabled" for all the middle devices. A terminating connector may be installed depending on the internal SCSI cable. If the SCSI cable ends with a terminating resistor, set "Disabled" for all the terminating resistors of connected devices. For the settings, see the manual provided with each device.

A file device needs settings such as a SCSI transfer rate. For the transfer rate, see the manual provided with the file device. Use the BIOS utility of the SCSI controller to make the settings. For details, see the manual provided with the SCSI controller.

An onboard Ultra320 SCSI connector can be used to connect with internal SCSI file device.

Connecting with Additional Disk Unit / Sample Connection in Maximum Configuration

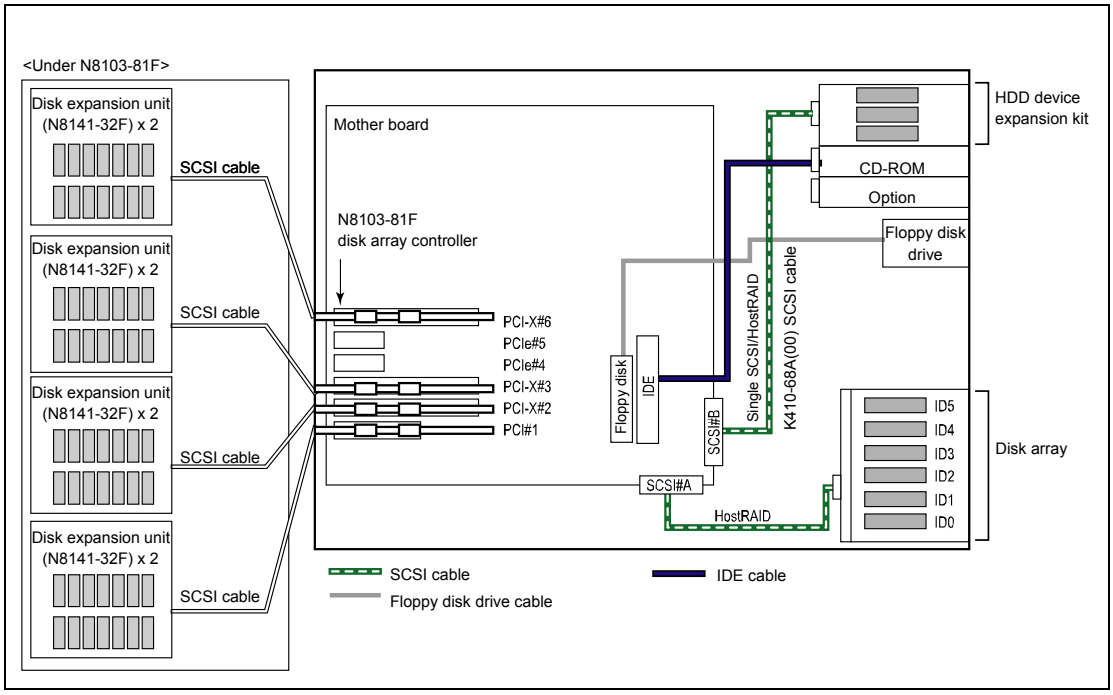
To connect an additional disk unit, or an external SCSI hard disk cabinet, to the server, the disk array controller board is required.

The additional disk unit can be connected to the server equipped with the disk array controller board. (A single N8141-32F cabinet contains 14 hard disks.)

> **IMPORTANT:** To connect with additional disk unit, use the server of rack-mount type, or use the additional disk unit of tower type (pedestal type). In both cases, you need an optional conversion kit.

The server can be connected with up to 521 hard disk drives.

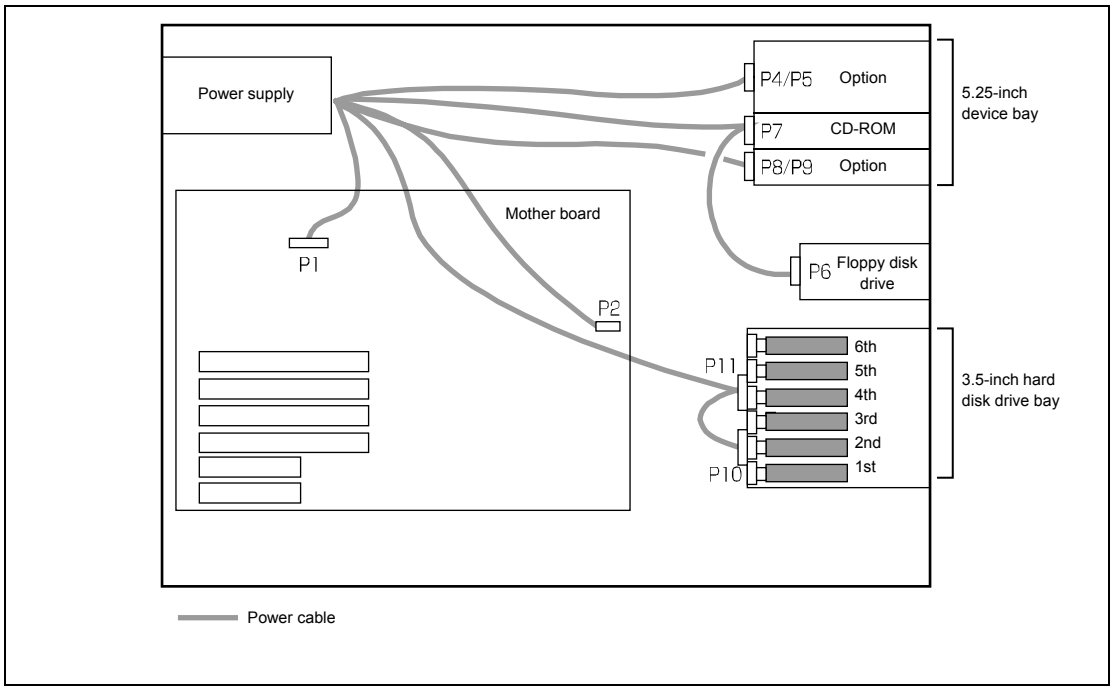
In the configuration, the disk array configuration cannot be provided for the four hard disks installed in the 3.5-in disk bays.



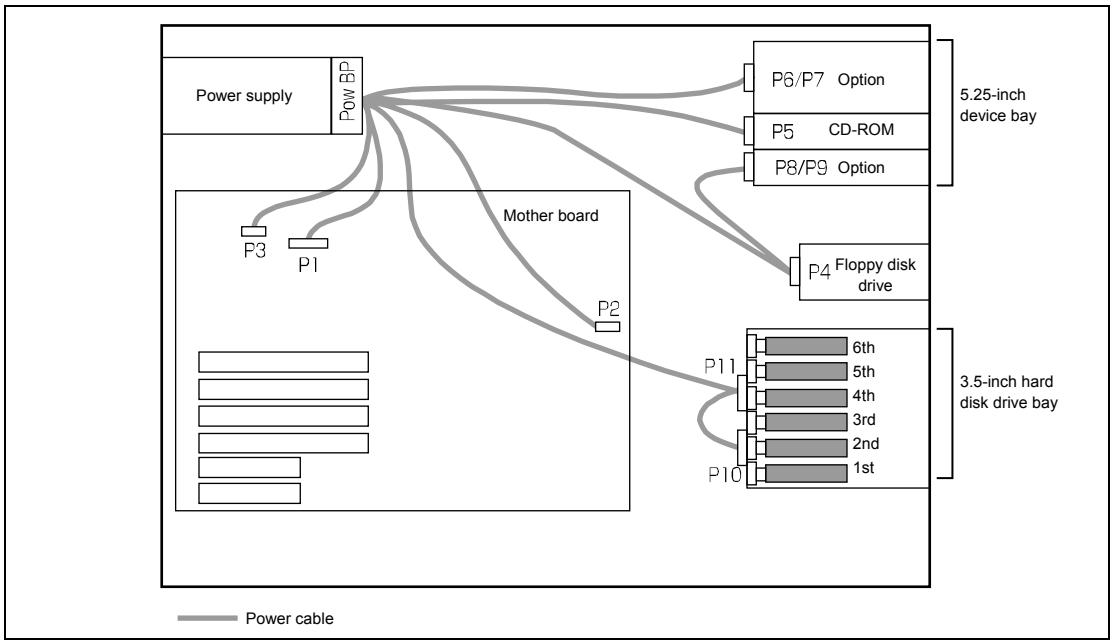
POWER CABLE

Proper connector numbers of format Pnn (nn: numeral) are printed on the power cables connected to the power unit installed in the server. The connector numbers and the built-in devices to which the connectors are connected are shown in the figures below.

N8100-941F



N8100-942F/943F



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Appendix A

Specifications

Item		NEC Express5800/120Lh		
		N8100-941F	**N8100-942F**	**N8100-943F**
CPU	Type	Intel® Xeon processor		
	Clock/2nd cache	3DGHz/1MB	3DGHz/1MB	3.40GHz/1MB
	Standard	1		
	Maximum	2		
Chipset		Intel E7520 (800MHz)		
Memory	Standard	512 MB (256 MB × 2)		
	Maximum	16 GB (2 GB × 8, the standard DIMM must be replaced.)		
	Expansion unit	2 DIMMs (256MB/512MB/1GB/2GB)		
	Expansion times	4 times		
	Memory module	SDRAM DIMM (DDR333[*1], Unbuffered type)		
	Error check	ECC		
Graphics (VRAM)		ATI RADEON 7000 (VRAM 8MB)		
Auxiliary storage device	Floppy disk (standard)	3.5-inch drive × 1 (standard)		
	Hard disk (standard)	None		
	Hard disk (maximum)	879GB (146.5GB × 6) 1.3TB (146.5GB × 9)[*2]		
	CD-ROM (standard)	ATAPI interface × 1 (x40 speed)		
5.25-inch file bay		4 slots (An ATAPI CD-ROM drive is factory-installed.)		
3.5-inch disk bay		1 slot (A 1.44MB-floppy disk drive is factory-installed.)		
Additional PCI slot		6 slots (2 for PCI EXPRESS (8-bus), 1 for 64-bit/133MHz PCI-X, 2 for 64-bit/100MHz PCI-X, and 1 for 32-bit/33MHz PCI)		
RAID		0/1 (standard), 5 (option)		
External interface	Keyboard	MINI DIN 6-pin connector (1 port)		
	Mouse	MINI DIN 6-pin connector (1 port)		
	USB	4-pin (2 ports)		
	Serial	D-sub 9-pin (1 port)		
	Parallel	IEEE1284 standard, D-sub 25-pin (1 port)		
	Network	RJ-45 (2 ports, 1000BASE-T/100BASE-TX/10BASE-T)		
	Display	MINI D-sub 15-pin (1 port)		
Cabinet design		Desk-side, mini tower		
External dimensions (including stabilizers)		941F: 292.1 (width) × 683 (height) × 453 (depth) mm 942F/943F: 292.1 (width) × 696.5 (height) × 453 (depth) mm		
Weight		20 kg (Max. 35 kg)		
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz		
Redundant power supply		–	1+1	
Power consumption		670 VA, 660 W		
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)		
	Humidity	20 to 80% RH (no condensation)		

*1 DDR266 when six or more DIMMs are installed.
*2 The optional HDD cage is installed.

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Appendix B

Other Precautions

Transfer Rate of the On-board LAN Controller

The onboard network interface controller supports 10Base-T and 100Base-TX networks and a capable of full or half duplex.

The controller can automatically detect and switch for network speed and transfer mode connected to the HUB. However, for proper network operation, specify the link speed and duplex mode to the same value as the value specified for HUB.

Server Management Software

The NEC EXPRESSBUILDER CD-ROM that comes with the server contains the NEC ESMPRO utility.

NEC recommends that you should install the NEC ESMPRO for effective use of the reliability enhancement features of the server.

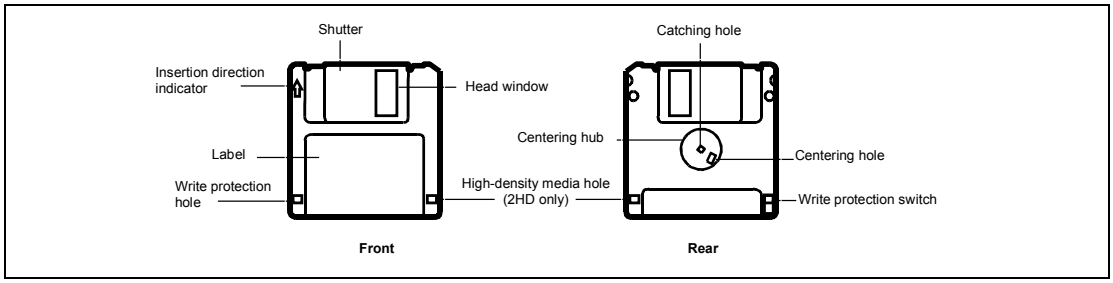
Floppy Disk

The following describes use of the floppy disk.

Floppy disk type

The server uses 3.5-inch floppy disks. You can use the following two types of 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
  Stores data of 720KB.



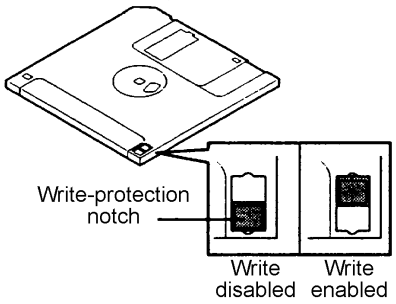
Notes on use

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently as far as it goes.
- Attach the label to the correct position.
- Do not write anything directly onto the disk surface with a pencil or ball-point pen.
- Do not open the shutter.
- Do not use the floppy disk in a dusty place.
- Do not place anything on the floppy disk.
- Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- Do not leave the floppy disk with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the floppy disk near any form of liquid or a chemical or in a place where a chemical may be accidentally sprayed over them.
- Do not place any magnetic objects (e.g., magnet) near the floppy disk.
- Do not clip the floppy disk or drop it.
- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.

- Write-protection

  A floppy disk has a write-protect switch that prevents the stored data from accidental erasure.



  You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. NEC recommends that you should write-protect any floppy disk containing valuable data unless you are about to save data.

  To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.

- Disk format

  To write data into a floppy disk, the floppy disk must be "formatted." "Formatting" is to initialize the floppy disk and make it available for the system environment (operating system).

  IMPORTANT:

  - Formatting a used floppy disk clears all the data contained in it, if any.
  - Formatting a floppy disk from the DOS command line is not available with the server. Use a formatted floppy disk to work with it on the DOS command line.

  The format method depends on your operating system. Refer to the manual that comes with your operating system for details.

- Data backup

  "Data backup" is to copy data stored in a media into another media (e.g., floppy disk, digital audio tape, or magnet-optical disk).

  IMPORTANT: Make sure to make a back-up copy of every floppy disk, if provided.

  The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or server failures, may cause loss of data. To avoid loss of data, NEC recommends that you should make a back-up copy of your valuable data on a regular basis.

CD-ROM

Keep the following notes in mind to use the CD-ROM for the server:

- Press the center of the storage case to remove the CD-ROM from the case.
- Do not drop the CD-ROM.
- Do not place anything on the CD-ROM or bend the CD-ROM.
- Do not attach any label onto the CD-ROM.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the CD-ROM with its printed side upward and gently put it on the tray.
- Do not scratch the CD-ROM or write anything directly on it with a pencil or ball-point pen.
- Do not leave the CD-ROM with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the CD-ROM in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are attached on the CD-ROM, wipe the CD-ROM from its center to edge with a dry soft cloth slowly and gently.
- Use the CD cleaner to clean the CD-ROM. Do not use record spray/cleaner, benzene, or thinner.
- Keep the CD-ROM in a CD-ROM case when not in use.

Tape Media

The following describes data handling with the DAT, DLT, or AIT optionally available for the server.

- Saving your valuable data

  When you save your valuable data or programs into the cartridge tape, you should save them into two cartridge tapes to make the primary and secondary tapes.

  This enables you to restore your data from one tape when the other makes a read error, as well as to protect your valuable data and programs from loss.

- Three-generation data management

  NEC recommends that you should employ three-generation data management for data storage.

  Three-generation data management uses three cartridge tapes: A, B, and C. You save data to tape A on the first day, tape B on the second day, tape C on the third day, tape A on the forth day, and so on. That is, you save data into cartridge tapes cyclically from tape A through C.

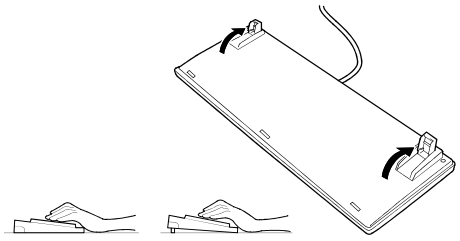
This enables you, for example, to use tape B to restore the data when tape C makes a read error. Also when both tapes B and C make a read error, you can restore your valuable data by using the data stored in tape A.

Keyboard

The keyboard is a device to instruct you computer by entering alphanumeric characters or symbols.

IMPORTANT:

- Do not pour any liquid such as water or put anything into the keyboard. Doing so may cause a failure of the keyboard.
- The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



NOTE: The keyboard functions depend on the software. Refer to the manual that comes with the software for details.

Mouse

Like the keyboard, the mouse is a device to instruct your computer. Many OS's and application software require the mouse for operation.

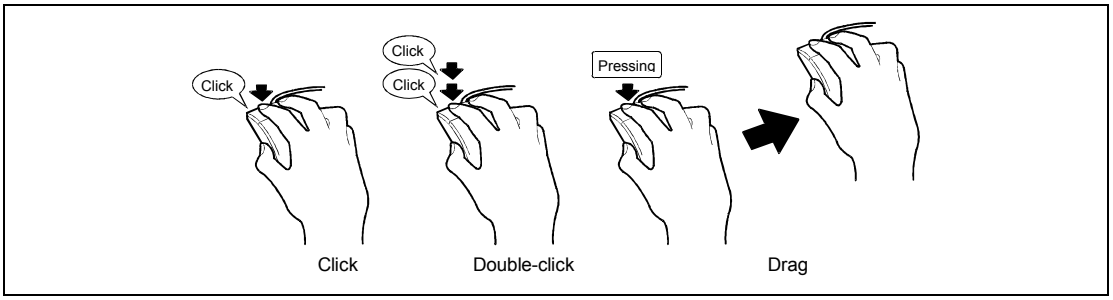
NOTE:

- Functions assigned to the mouse buttons vary depending on the software. For details, refer to the manual provided with the software.
- Use the mouse on a clean desk. Using the mouse on a dusty or dirty desk disturbs smooth movement or normal operation of the mouse. When your mouse movement seems dull, clean your mouse. (See Chapter 7.)

Mouse operation includes "Click," "Double-click," and "Drag."

Click:	Press the button only once and release it.
Double-click:	Press the button twice consecutively and release it.
Drag:	Press and hold the button and move the mouse.

Operation of the server involves combinations of these mouse operations and data entries with the keyboard.



Appendix C

IRQ and I/O Port Address

The factory-set interrupt requests and I/O port addresses are listed below. Find an appropriate one to install an optional device.

Interrupt Request

The factory-set IRQs are assigned as follows:

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	9	–
1	Keyboard	10	PCI
2	–	11	PCI
3	COM B	12	Mouse
4	COM A	13	Numeric coprocessor
5	PCI	14	Primary IDE
6	Floppy disk	15	Secondary IDE
7	Parallel	16	USB
8	Real-time clock		

I/O Port Address

The factory-set I/O port addresses for the server are assigned as follows:

Address *1	Chip in Use *2
00 - 1F	DMA controller
20 - 2D	Interrupt controller
2E - 2F	Super I/O configuration
30 - 31	Interrupt controller
34 - 35	Interrupt controller
38 - 39	Interrupt controller
3C - 3D	Interrupt controller
40 - 43	Timer controller
4E - 4F	Super I/O configuration
50 - 53	Timer/counter
60	Keyboard/mouse
61	NMI
62	LPC reserve
63	NMI
64	Keyboard/mouse
70 - 77	NMI/real-time clock
80 - 91	DMA controller
92	Port 92
93 - 97	DMA
A0 - A1	Interrupt controller
A4 - A5	Interrupt controller
A8 - A9	Interrupt controller
AC - AD	Interrupt controller
B0 - B1	Interrupt controller
B2 - B3	Advanced power management
B4 - B5	Interrupt controller
B8 - B9	Interrupt controller
BC - BD	Interrupt controller
C0 - D1	DMA controller
D2 - DF	DMA controller
F0	Coprocessor error
F1 - FF	Logic device configuration
170 - 177	IDE secondary bus controller
1F0 - 1F7	IDE primary bus controller
2F8 - 2FF	Serial port 2
376	IDE secondary bus controller
370 - 377	(Floppy disk drive 2), IDE 2
378 -37F	Parallel port
3F0 -3F5	Floppy disk drive
3F6	IDE primary bus controller
4D00 -4D1	Interrupt controller
678 -67D	Paralle port
CA2 - CA3	BMC SMS interface
CA4 - CA5	BMC SMS interface
CF8 - CFB	PCI configuration address/reset control (CF9)
CFC - CFF	PCI configuration data

*1 Hexadecimal notation
*2 I/O port address for PCI devices can be arbitrarily assigned according to the type and number of PCI devices.

Appendix D

Installing Windows Server 2003

This section describes the procedures for installing Windows Server 2003 without using Express Setup tool.

BEFORE INSTALLING WINDOWS SERVER 2003

Please read carefully the following information BEFORE commencing your Windows Server 2003 Installation.

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you change the configuration of the system, update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

Re-installing to the Hard Disk which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Manual Installation when N8103-65F/80F/81F Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally. Disconnect MO Device and restart the installation from the beginning.

Partition Size

The minimum required partition size for installation of Windows Server 2003 is:

2900MB + Paging file size + Dump file size

Paging file size (recommended) = Mounted memory size * 1.5

Dump file size = Mounted memory size + 12 MB

IMPORTANT:

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information(memory dump) may not be collected.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if installed memory size is 512MB, the minimum required partition size is

2900MB + (512MB * 1.5) + (512MB + 12MB) = 4192MB.

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the file size to be written, then after installing the system using the "Size required for installation + Paging file size," install an additional new disk.)

INSTALLING WINDOWS SERVER 2003

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows Server 2003 Standard Edition / Microsoft Windows Server 2003 Enterprise Edition (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER

Creating "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003, you do not need to create it again.

You can create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

  If you have only NEC Express5800 Server to create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server, you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
4. Press the RESET switch or press **Ctrl** + **Alt** + **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].
6. Select [Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.

7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

   Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

- Create from [Master Control Menu]

  [Master Control Menu] runs on the following operating systems.

  – Windows Server 2003
  – Windows 2000
  – Windows Me/98/95
  – Windows NT 4.0
  – Windows XP

  You can create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Run the operating system.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

   [Master Control Menu] will appear.

4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003].

   NOTE: You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

   Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

Windows Server 2003 Clean Installation

This section explains how to perform a clean installation of Windows Server 2003.

1. Turn on the system power.
2. Insert the Windows Server 2003 CD-ROM in the CD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk, this step is unnecessary.

   The Windows Server 2003 setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. Press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed at the upper part of the screen.

   NOTE: Nothing is changed on the screen through **F6** is pressed.

   – "Setup is inspecting your computer's hardware configuration ..." is displayed.

   – A screen with a solid blue background is displayed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.
5. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```
6. Insert the Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   A list of mass storage devices is displayed.

   Select the [Adaptec Ultra320 SCSI Cards (Win XP/Server 2003 IA-32)] and press **Enter**.

   Then, it returns to the screen of Procedure 5.

7. If the RAID controller (including embedded HostRAID feature) or SCSI controller is installed, select the proper SCSI Adapter and press **Enter**.
   - Adaptec HostRAID U320 Driver Ver 1.02 For Windows 2000/XP/2003 (When HostRAID is installed.)
   - MegaRAID SCSI 320-1 RAID Controller (When N8103-80F board is installed.)
   - MegaRAID SCSI 320-2 RAID Controller (When N8103-81F is installed.)
   - Adaptec I2O RAID Driver Disk for 32bit Windows 2000/XP/2003 (When N8103-86F is installed.)

Continue performing tasks according to the subsequent messages that appear.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

Upgrade Installation

Procedures below upgrade the installed Windows 2000 to Windows Server 2003.

1. Power on the system and start Windows 2000.
2. Log on as an administrator.
3. Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.

   Then, [Select an operation] dialog will appear.

   NOTE: If the [Select an operation] dialog box does not appear, start \SETUP.EXE from CD-ROM drive.

4. Select [Install Windows Server 2003].

   Then, a dialog box asks to select the upgrade or clear installation.

5. Select "Upgrade (recommended)" and click the Next.

   Follow the messages and continue. The system will automatically restart after copying the files.

   NOTE: You can leave the Windows Server 2003 CD-ROM in CD-ROM drive.

6. Press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed at the upper part of the screen.

   NOTE: Nothing is changed on the screen through **F6** is pressed.

7. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```

8. Insert the Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   A list of mass storage devices is displayed.

   Select the [Adaptec Ultra320 SCSI Cards (Win XP/Server 2003 IA-32)] and press **Enter**.

   Then, it returns to the screen of Procedure 5.

9. If the optional board is installed, select the proper SCSI Adapter and press **Enter**.
   - MegaRAID SCSI 320-1 RAID Controller (When N8103-80F board is installed.)
   - MegaRAID SCSI 320-2 RAID Controller (When N8103-81F is installed.)

   Continue performing tasks according to the subsequent messages that appear.

10. Update the system.

11. Install the driver and make detailed settings.
    - If PROSet is already installed, uninstall the PROSet before upgrading.

      If the teaming function is enabled, disable the function before uninstalling PROSet.
    - During upgrade installation, [Disk Insert] dialog box may appear.

      If it appears, click Cancel.
    - When upgrade installation is completed, [Device Driver Wizard] dialog box may appear.

      If it appears, click Cancel, then update the system.

Reinstallation to Multiple Logical drives

This subsection describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.
2. Specify the partition in which you want to install the operating system when the following message appears:

   ```
   The following list shows the existing partitions and
   unpartitioned space on this computer.

   Use the UP and DOWN ARROW keys to select an item in the list.
   ```

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation again following the procedure described earlier in this chapter.

   The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

   > Changing the drive letter of a volume may cause programs to no longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu is automatically appeared on the screen.
3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [Restart Computer] to restart the system.
6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

IMPORTANT: If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "PROSET.EXE" in the following directory.

   CD-ROM DriveLetter:\WINNT\DOTNET\BC3\PROSET\WS03XP32

   The [Intel(R) PROSet - Install Shield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

   * The procedure in the case of the classic start menu

     1. Click Start menu, Click [Settings] and Click [Network Connections].

        The [Network Connections] dialog box appears.

     2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

   The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet for Wired Connections] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel] and click [Intel(R) PROSet Wired].

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

2. Click [(Network Adapter Name)] in the list.

3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.

4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

NOTE: We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setup for TroubleProcess" later in this document.

Re-install the Network Driver

The network driver will be installed automatically.

Update Graphics Accelerator Driver Mounted in Standard

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\VIDEO\RADEON7000\W2K3\SETUP.EXE

   * Install the graphics accelerator driver in the following directory if you communicate your server with the remote KVM console. (Optional advanced remote management card (N8115-02) must be installed in your server to use the remote KVM console.)

     <CD-ROM Drive Letter>:\N8115-02\VIDEO\RADEON7000\SETUP.EXE
4. Follow the message to continue the installation.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix E

Installing Windows 2000

This section describes the procedures for installing Windows 2000 without using Express Setup tool.

BEFORE INSTALLING WINDOWS 2000

Please read carefully the following information BEFORE commencing your Windows 2000 Installation.

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you change the configuration of the system, update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

Re-installing to the Hard Disk which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally. Disconnect MO Device and restart the installation from the beginning.

Partition Size

The minimum required partition size for installation of Windows 2000 is:

1000MB + Paging file size + Dump file size

Paging file size (recommended) = Mounted memory size * 1.5

Dump file size = Mounted memory size + 12 MB

IMPORTANT:

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information(memory dump) may not be collected.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if installed memory size is 512MB, the minimum required partition size is

1000MB + (512MB*1.5) + (512MB+12) = 2292MB.

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the file size to be written, then after installing the system using the "Size required for installation + Paging file size," install an additional new disk.)

INSTALLING WINDOWS 2000

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows 2000 Server / Microsoft Windows 2000 Advanced Server (CD-ROM)
- Windows 2000 Service Pack (CD-ROM)
- User's Guide
- Getting Started
- Windows 2000 OEM-DISK for NEC EXPRESSBUILDER

Creating "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows 2000, you do not need to create it again.

You can create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

  If you have only NEC Express5800 Server to create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server, you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
4. Press the RESET switch or press **Ctrl**, **Alt** and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].
6. Select [Windows 2000 OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.

7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

Windows 2000 OEM-DISK for NEC EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

- Windows Server 2003
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0
- Windows XP

You can create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.

2. Run the operating system.

3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Master Control Menu] will appear.

4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows 2000].

NOTE: You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

Windows 2000 OEM-DISK for NEC EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

Windows 2000 Clean Installation

This section explains how to perform a clean installation of Windows 2000.

1. Turn on the system power.
2. Insert the Windows 2000 CD-ROM in the CD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk, this step is unnecessary.

   The Windows 2000 setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. Press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed at the upper part of the screen.

   NOTE: Nothing is changed on the screen through **F6** is pressed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.
5. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```
6. Insert the Windows 2000 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   A list of mass storage devices is displayed.

   Select the [Adaptec Ultra320 SCSI Cards (Win2000)] and press **Enter**.

   Then, it returns to the screen of Procedure 5.

7. If the RAID controller (including embedded HostRAID feature) or SCSI controller is installed, select the proper SCSI Adapter and press **Enter**.
   - Adaptec HostRAID U320 Driver Ver 1.02 For Windows 2000/XP/2003 (When HostRAID is installed.)
   - MegaRAID SCSI 320-1 Controller Driver (When N8103-80F board is installed.)
   - MegaRAID SCSI 320-2 Controller (When N8103-81F is installed.)
   - Adaptec I2O RAID Driver Disk for 32bit Windows 2000/XP/2003 (When N8103-86F is installed.)

Continue performing tasks according to the subsequent messages that appear.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

Reinstallation to Multiple Logical Drives

This subsection describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.
2. Specify the partition in which you want to install the operating system when the following message appears:

   ```
   The following list shows the existing partitions and
   unpartitioned space on this computer.

   Use the UP and DOWN ARROW keys to select an item in the list.
   ```

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.
3. Continue the clean installation again following the procedure described earlier in this chapter.

   The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

   > Changing the drive letter of a volume may cause programs to no longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System - Installing Service Pack -

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu is automatically appeared on the screen.
3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [Restart Computer] to restart the system.
6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

IMPORTANT: If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

PROSet

PROSet is a utility that confirms the function of network contained in network driver. Be sure to install. Utilizing PROSet enables the following issues:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Specify teaming.

Configuring several network adapters as one team provides the server an environment tolerant on any trouble and enhance through put between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Program], [Accessory] and click [Explorer].
3. Run "PROSET.EXE" in the following directory.

   <CD-ROM DriveLetter>:\WINNT\W2K\BC3\PROSET\WIN2K\

   The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

[When PROSet is not installed]

1. Click Start menu and click [Network and Dial-Up Connection].

   The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

   The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

   The property dialog box for network adapter appears.

4. Click the [Advanced] and specify the [Link Speed & Duplex]value the same as the value specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

> **NOTE:** We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setup for TroubleProcess" later in this document.

[When PROSet is installed]

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

   The [Intel(R) PROSet for Wired Connections] dialog box appears.

2. Put the cursor to the network driver in the list.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

Also specify the other network driver with the same progress above.

Re-install the Network Driver

After installing OS and deleting the network drivers, if you want to re-install the network drivers, follow the procedure below.

1. Restart OS and logon to your system.
2. [Upgrade Device Driver Wizard] dialog box appears.

   Click [Next].
3. Confirm that the [Search for a suitable driver for my device (recommended)] radio button is selected and click [Next].
4. Select the [Specify a location] check box and deselect other check boxes.

   Click [Next].
5. Other [Upgrade Device Driver Wizard] dialog box opens.

   When using [Intel(R) PRO/1000CT Network Connection],specify [<CD-ROM drive letter>:\WINNT\W2K\BC3\PRO1000\WIN2K].

   Then click [OK].
6. Click [Next].
7. Click [Finished].

   After re-installing the network drivers, the link speed and Duplex mode need to be specified.

   Refer to "Network Driver" described earlier.

Install Graphics Accelerator Driver Mounted in Standard

Install the display driver using the following procedure.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\VIDEO\RADEON7000\W2K\SETUP.EXE

   * Install the graphics accelerator driver in the following directory if you communicate your server with the remote KVM console. (Optional advanced remote management card (N8115-02) must be installed in your server to use the remote KVM console.)

     <CD-ROM Drive Letter>:\N8115-02\VIDEO\RADEON7000\SETUP.EXE

4. Follow the message to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue. If the dialog message "Direct X Ver.8 isn't installed." appears, select [continue] to continue.

5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

USB 2.0 Driver

USB 2.0 Driver is pre-installed. When restoring the system or re-installing the system, the driver is automatically installed in the process of updating the system.

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix F

Product Configuration Record Table

Use this table for information about setup and system environment change.

Hardware

Main Unit						
	Model name		Serial No.		Date Installed	
CPU						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
Memory						
#1	Size		Serial No.		Date Installed	
#2	Size		Serial No.		Date Installed	
#3	Size		Serial No.		Date Installed	
#4	Size		Serial No.		Date Installed	
#5	Size		Serial No.		Date Installed	
#6	Size		Serial No.		Date Installed	
#7	Size		Serial No.		Date Installed	
#8	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Hard Disk						
Bay #1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #6	Type			Serial No.		
	Capacity			Date Installed		
	Type number					

5.25-inch Device						
Slot 4	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
Slot 3	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
Slot 2 (standard ATAPI CD-ROM drive)	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
Slot 1	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
3.5-inch Device						
Slot 1 (standard 1.44-MB floppy disk drive)	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
PCI Slot #1						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3						
	Model name				Serial No.	
					Date Installed	
PCI e Slot #4						
	Model name				Serial No.	
					Date Installed	
PCI e Slot #5						
	Model name				Serial No.	
					Date Installed	
PCI Slot #6						
	Model name				Serial No.	
					Date Installed	
Printer						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date Installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 3						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 4						
	Model name				Serial No.	
	Manufacturer				Date Installed	

Software

Firmware version			
OS Application of RUR media	 ☐ Apply	Name: Name:	Version: Version:
File system	☐ FAT ☐ Others (	☐ HPFS	☐ NTFS)
Bundled software installed			
Licensed software installed			
Application running when a failure occurred			
Remarks			

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